Sir Græme H. Elphinstone, Bart.

The TROPICAL AGRICULTURIST MONTHLY.

Vol. XIX. COLOMBO, FEBRUARY 1st, 1900. No. 8.

"PIONEERS OF THE PLANTING ENTERPRISE IN CEYLON."

(Third Series.)

THE LATE SIR JAMES D. ELPHINSTONE, BART.

AND

SIR GRÆME H. D. ELPHINSTONE, BART.

NO one acquainted with the history of Coconut, Coffee, Cinchona and Tea Planting in Ceylon, can for a moment deny the right of the two gentlemen at the head of our column—the late and the living Baronets—to be included in the list of PLANTING PIONEERS OF CEYLON. Sir James Elphinstone was connected with Ceylon from 1837 till his death in 1886—close on 50 years. He was one of the first Europeans to go in for Coconut planting in the Jaffna peninsula. He became a Ceylon Coffee Estate proprietor at the very beginning of the enterprise in the early "forties." He was at the time Commander of an "East Indiaman," and, visiting the island, he traversed the hill-country when there was no road beyond Gampola, and, penetrating into the Kotmale Valley, selected the Baharundrah block, having for his neighbours Capt. Forbes and Capt. Payne-Gallwey.

Much might be said of general interest about nearly-related and distinguished members of the families of Elphinstone and Dalrymple; but such records would unduly swell our memoir, and we must content ourselves with "one leaf out of the past," referring to the notable lady who was mother of Sir James, and grandmother of Sir Graeme,—after whom indeed he was called "DAME GRÆME DALRYMPLE HORN ELPHINSTONE,"—born May 10th, 1782, died, aged 88, on January 28th, 1870; and we give the following reference published at the time of her death:—

THE LATE DOWAGER LADY DALRYMPLE HORN ELPHINSTONE.

(From the "Aberdeen Journal," February 9, 1870.)

Our obituaries of the past week have chronicled the death of a venerated lady, of the last century, one of a generation now fast passing away, and in her instance claiming something more than an ordinary notification.

The Dowager Lady Dalrymple Horn Elphinstone entered on the duties of the House she has so mnch dignified and adorned for the last threescore and ten years in the first of the century, then a yonny bride of eighteen, and a wide circle of relatives and a very wide one of friends in all ranks of life now mourn for "one removed" of no ordinary dignity of character and personal bearing; endeared to, and reverenced by all around her far beyond the happy lot of most who die. Of her, indeed, it might almost be said, "to see her was to love her." Those who knew her will readily echo this.

Her character was of the most engaging kind. To the writer of these lines—whose happy recollection of this, his elevated, earliest, *beau ideal* of a *lady* reaches beyond half a century back—she seemed to

embody what the poet has so finely, if quaintly, pictured of

> That sweet attractive kind of grace,
> A full assurance given in looks,
> Continual comfort of a face
> The lineament of gospel-books;
> For sure that countenance cannot lie,
> Whose mind is written in the eye.

She must have appeared in some sort thus to all who were privileged to know her. Those who knew her more intimately found in Lady Elphinstone a humble, earnest Christian, exhibiting a life remarkable for its consistency—marked by unostentatious benevolence and kindness—with a liberality as considerate as it was untiring; and the warmth of her heart, her affection and friendship towards persons of all classes, endured with her life. Single-mindedness; utter scorn of meanness; an almost fiery indignation at the sight of wrong or injustice—withal a grand simplicity, a noble pureness of nature that was manifested even in her outward appearance, inspired those who came under her influence with an affection and reverence not easy to describe. With her everything was in earnest; all around her felt it. Her rule of life was 'Duty," She might, herself, have written the pregnant words, "But my guiding-star was, *and will be*, 'Duty,'' and pleasure and desire of the heart must wait, even for ever, if necessary, when Duty calls."

Her personal appearance was very striking. To the refined beauty of countenance and expression (which marked her even in old age), and the sweet graceful dignity of figure and bearing which distinguished her in youth, were added, as years increased, a certain stateliness of demeanour, which, tempered as it was by warm-hearted kindness, impressed themselves on all who approached her. Her mental and personal qualities combined, in truth, to form a personage of no ordinary stamp. She was, all in all, one the like of whom we but rarely meet with in the pilgrimage of life. In some of her characteristics, indeed, she belonged to a class of which few representatives remain; such as are embalmed in the pages of the "Lives of the Lindsays,"—the highest form of Scottish character: bright examples of what a Scottish training could be in our fathers' days.

Græme Hepburn, who became "Our Lady Dalrymple Horn Elphinstone," was born on the 10th of May, 1782. Her father, Colonel David Hepburn, was descended in the male line from the ancient family of Congalton of Congalton, or "of that Ilk," in East Lothian, which held considerable possessions in that country as early as the 13th century. (See Chalmers's "Caledonia," and Douglass's "Baronage of Scotland.") In the reign of Charles II., William Congalton of that Ilk, through his marriage with the niece and eventual heiress of Sir Robert Hepburn of Keith-Marischal, assumed the name of that family, a branch of the Hepburns of Hailes, ancestors of the Earls Both well (Douglas's "Peerage of Scotland.") His son, Robert Congalton Hepburn, succeeded him, who, with his three sons, joined the insurrection of 1715. (Some interesting facts connected with the family during that "affair" are given by Sir Walter Scott in "The Tales of a Grandfather," 3rd series). Robert Hepburn's youngest son, James, eventually succeeded him. He went "out" a second time in 1745, being the first gentleman who tendered his allegiance to Prince Charles Edward at Holyrood. James Hepburn was a man of most amiable qualities and varied powers and accomplishments. He is described by John Home in his "History of the Rebellion" as a model of ancient manliness, simplicity, and honour, who sacrificed himself to a visionary idea of the independence of his country. Dr. Carlyle, in his Memoirs, also highly eulogises his character. Mr. Hepburn married Katherine Rickart, heiress of Rickartoun, in Kincardineshire, and assumed her surname additionally. By her, besides one daughter, Katherine, wife of General Græme of Braco (private Secretary to Queen Charlotte, and Equerry to King George III.) by whom she had an only child, Katherine, Viscountess Hampden, he left two sons: 1st, Colonel Robert Rickart-Hepburn, long M.P. for Kincardineshire, father of Colonel William R. Hepburn, of Rickartoun, whose son, William R. Hepburn, now possesses the estate; and, 2nd, Colonel David Hepburn, who married Bethia Graham, descended of the family Inchbraikie, a branch of the House of Montrose, and left, besides one surviving daughter, Græme, the subject of this memoir, two sons; James, who married Louise, daughter of the Count de la Martilliere (both deceased without surviving issue); and Francis, Colonel, 3rd Foot Guards, Major-General and C.B., a distinguished Peninsular and Waterloo officer, who, by his wife Henrietta, eldest daughter and co-heiress of Sir Henry Poole, Bart. of Poole Hall, Cheshire, and The Hooke, Sussex, left issue, Colonel Henry Pool Hepburn, C.B., now commanding the 1st Battalion, Scots Fusilier Guards, Francis Robert, Rector of Chailey, Sussex, and one daughter, Charlotte Frances Anne Hepburn.

Miss Græme Hepburn married in 1800, at the age of 18, Robert Dalrymple Horn Elphinstone of Horn and Logie-Elphinstone, Lieut.-Colonel 3rd Foot Guards, son of General Robert Dalrymple Horn of Horn and Westhall, by his wife Mary, daughter and heiress of Sir James Elphinstone, Bart. of Logie-Elphinstone; and who had lately succeeded to the family estates by the death of his elder brother without issue. By him, who was created a Baronet in 1828, in consideration of his being, through his mother, the representative of the Elphinstone family and who died in 1848, aged 82, she had issue fifteen children, ten sons and five daughters, of whom eight remain, the eldest surviving son being Sir James Dalrymple Horn Elphinstone, Bart. of Logie-Elphinstone, M.P.

Although instances of more advanced age not unfrequently occur, this venerable lady formed an interesting link with a byegone time. Belonging to a family that cherished the traditions of still earlier days, she passed much of her youth in Edinburgh, and, besides the information she had inherited from a former generation, her own recollections of Scottish society, seventy years ago, were very picturesque and striking. She spoke from personal knowledge of many whose names have now passed into the regions of history; men who had fought at Prestonpans and Culloden; ladies who danced at the balls at Holyrood during Charles Stuart's six weeks' reign; veterans who had served at Fontenoy and Dettingen and Minden; men of letters, of whom Scotland could then boast a brilliant circle; of the emigrant French *noblesse*, who clustered round their exiled Princes, then resident, at Hoolyrood. Of all these, and of the leaders of Scottish society at the close of the last century, her anecdotes were full of character and interest, even in the latest years of her life, which were mercifully and blessedly free from any clouding of the spirit or mind.

But, though she cheerfully drew from her memory reminiscences like the above, it was not in such things that her heart rested. She was continually looking above and beyond this world, which she felt was not her abiding place. She lived from day to day, awaiting the summons of her Lord, and shedding to the last a grace on those around her. She has left a bright example and a blessed memory, never to be forgotten by those who knew her.

Another very notable member of the family was General John Hamilton Elphinstone Dalrymple, C.B., a brother of Sir James Elphinstone, and who greatly distinguished himself in the Crimea as Lieut.-Colonel in the Scots Fusilier Guards. We now come to the generations and personalities

immediately under notice, and we are fortunate enough to have a graphic account from a gentleman who was intimately acquainted with "Logie" and its inmates in its early days. The following speaks for itself:—

MONEO ET MUNIO. *

(Notes by Old Colonist.)

"TWO BOYS" was the brief news brought to Captain———not yet *Sir* James—as he patrolled the lawn in front of West Hall house one fine morning in 1841.

The bearer of the news was Lady Elphinstone, his mother, and the brusque Captain laconically replied "*Two!*"—adding *sotto voce*, "One too many for a poor man."

The Elphinstone family have a tremendous long pedigree, deservedly honoured in the Garioch for the past two-and-a-half centuries. Albeit a fruitful race, Lady Elphinstone herself —one of the noblest and most beautiful of her sex—contributing 15, of whom James was the eldest alive, somehow the acres did not multiply in proportion to the members of the family. Yet Logie and West Hall were amongst the most valuable properties in the "Granary of Aberdeenshire" and might with care have sustained a very large retinue.

West Hall, the loveliest in the locality, a beautiful brae-side with grand old ivy-clad house picturesquely situated amongst its old umbrageous trees. Logie, more home-like, stands on sheltered terrace within sound of the ripple of the river Gadie, where in a wooded nook it meets the Ury—as if by tryst. The house—an ideal "*Auld House*"—was built about 180 years ago and has undergone but few alterations. In front of both stands Benachie, around the foot of which wimples the Gadie of sweetest song.

There are few more hallowed spots in Scotland than the banks of the Gadie, none to which exiles look back with greater affection, or sing its praises with more pathos. A poor little rivulet—a mere burn, in which two can scarcely paddle abreast and yet, says a traveller, while lying on the banks of the greatest river in the world, surrounded by threatening savages, my inmost thoughts found expression in:—

"O! gin I were whaur Gadie rins
At the foot o' Benachie."

There are at least a dozen versions of this very pathetic song, but always with the same refrain. I well remember accompanying the eminent antiquarian, Chas. Dalrymple, on an expedition through the district, the object of which was partly to open up some ancient mounds and partly to collect from the oldest residents, such words of the local song as they could recollect. It was amusing to hear an old crone with cracked voice singing:—

"I never had but ae richt lad,
But ae richt lad, but ae richt lad,
The teen was killed at Lourin fair,
The tither was drooned i' the Dee"

Or more pathetically the old widower's:—

"O! gin I were whaur Gadie rins,
Whaur Gadie rins, whaur Gadie rins
Or she that dwalt where Gadie rins,
O! gin she were wi' me!

It's no the hill, though it be brave
It's no the sowp o' Gadie's wave—
But she that bloomed o'er a' the lave
And gae her heart to me.

Tho' few to welcom me remain
Tho' a I lo'ed be deid and gane,
Ill back tho' I should live alane,
To the foot o' Benachie."

Many are the associations connected with Logie, the most hospitable of houses. The family was Jacobite in its sympathies, as indicated by the frequency of the name *James*, but not being over-demonstrative partisans, they escaped notice, and were able to render hospitality to the less fortunate, whose lands were confiscated. A story is told of the attainted Lord Pitsligo occasionally leaving his hiding-place on Benachie to spend a jolly night with the Elphinstones. Lady Elphinstone commented upon the *hard* drinking into which the friends would fall on a safe night, but was answered by the humorous refugee that "if she was sitten upon a cauld bare stane up on Benachie, we naething but burn water, she micht ca *that* hard drinking."

The neighbouring townships of Inverurie and Port Elphinstone were much indebted to the Elphinstone family—the latter indeed for its name and the 16-mile canal which connected it with Aberdeen; while the North of Scotland Railway may be said to have been initiated and carried through by the public spirit of the late Sir James. In reading up the old records of Inverurie I find, by the way, that the Clan Ferguson is very largely represented, the name being the most common in the annals of the village and in a solitary Tytler—"the last of the portioners"—I trace the father of our own R.B.T.

The grandfather of the late Sir James, General Robt. Dalrymple, was an officer of long and distinguished service which began actively in the expedition to Carthagena as aide-de-camp to his relative, Lord Cathcart. The celebrated Tobias Smollet was a surgeon in this expedition and describes it in "Rodrick Random." The first Sir James Elphinstone of Logie acquired the lands in 1670. He was a Writer to the Signet and unfortunately subscribed largely to the disastrous Darien Scheme by which so many of the Scottish gentry were severely bitten. Probably the next tropical investment was in Ceylon. When the late Sir James was Commander of an East Indian, he visited the island and, as he told us at the Kadienlena dinner, explored the valley of Kotmalie in the early forties, reached the patana on the opposite side of the oya and looking towards the S.W., saw a ridge to shelter him from the monsoon and then resolved to anchor.

It is now high time to return to our boys of whom the ever-cheery father soon got very fond and proud; named one after his grandfather Robert; the other after the *grandmother*, *Græme*. The boys grew and flourished; early developing their individual idiosyncrasies, showing in a marked manner how the child "is father of the man." Bob,

* The motto of the family "I warn and guard."

the eldest by 15 minutes, was perhaps the greatest favourite in the nursery. Græme, open, guileless and unsophisticated, ever fond of a yarn, would repeat everything he heard; while Bob showed a diplomacy which better suited the aims of the servant maids. At the same time the old nurse predicted that 'Græme would make money and Bob would spend it.' The very fact of their being in some things so much unlike, seemed to draw them closer together: as boys they were inseparable, and ever the most affectionate of brothers. When the time came for schooling they were sent to England—Harrow, I believe; and Logie saw little of them for some years. When they did ultimately return the boys had grown into stalwart youths, the peculiar characteristics however being unaltered: Bob, the sportsman and lady's-man; Græme, the plodding working-man, he too was an adept at sport; shooting, fishing, cricket and football came natural enough to him, but his tastes lay chiefly in putting his hand and shoulder to some useful industry.

The old gardener had a peculiar penchant for attending all the funerals far and near. Master Græme, nothing loth, would take his plâce in the garden. One day the two youths went out after lunch. Bob seized his fishing-rod and sauntered down the Gadie, while Græme, seeing the gravel in front of the house required doing up, threw off his coat, went to the tool-house for a rake and started work as if to the manner born. Presently up drives Lord Kintore with a bevy of ladies, who, seeing the young gardener in shirt sleeves, called out, "Are the young gentlemen at home?" "Yes," said Græme, touching his straw hat, "there is one down there fishing." So Bob, to his chagrin, was called up, while Græme slipped away raking along the shady walks and was lost for the afternoon.

The time was now approaching when a future career must be chosen and Græme, whose greatest ambition was to be a bread-winner, turned his thoughts towards Baharundrah in Ceylon. The estate had hitherto been always a disappointment, leaving year after year only a further loss. Yet other coffee estates were doing well—Poengalla, for instance, the property of his relative, Patrick Boyle, returning a handsome profit—and peradventure he thought Baharundrah with careful, energetic and judicious management might show equally good results. So, to Ceylon he went and as everybody knows literally put his shoulder to the wheel. First impressions were not encouraging. After walking once over the estate he returned to the bungalow almost in despair, and had thoughts of leaving the island at once, to try his luck farther East. On second thought he however resolved to try the effects of manure and careful cultivation. With what excellent results we now all know. For fifteen years there was no more active or prosperous man in Ceylon than "Logie." A planter amongst planters, a chief amongst men, and no one ever better deserved a continuance of prosperity. But *Hemileia* was a leveller, the blow fell upon the just and unjust alike; the carefully cultivated estate and garden of the sluggard alike suffered. The transition from coffee to tea had to be faced, and no one faced it more bravely than Logie, who indeed was amongst the first to show the way; and had his good friends at home been but well enough advised to continue their support through this critical period, Sir Græme Hepburn Dalrymple Elphinstone would unquestionably have been amongst the wealthiest men in Ceylon or the Garivels today.

To the above graphic narrative we can only add, in the first place, a statistical record, noting the connection with Ceylon and the rapid extension of interests, until the present Baronet, then universally known as "Logie," became one of the biggest "lairds" among the planting community of Ceylon. We find that, so far back as the "forties," Sir James Elphinstone owned, in Kotmale district, Baharundrah and Reillagalla estates; while in 1853, they are entered in an official list as belonging to "Sir James Dalrymple"—his original name before "Elphinstone was added to it." In the same year four Coconut plantations in the Northern Province are given as follows:—

Name of Estate.	*Proprietors.*
Victoria	G. E. Dalrymple
Klaly..	H. E. Dalrymple
Nungavil	Sir J. D. Elphinstone
Tattovenkotty.. ...	Heirs of Sir E. D. Elphinstone

—all members of the same family.

In our Directory for 1859, we find no change; but in the issue for 1864-65, the name of the son "Mr. G. D. Elphinstone" appears for the first time as Manager of the Kotmale estates. Then in 1869 we get the area in coffee on Baharundrah and Westhall as 900 acres; while Donside (a new estate owned by Mr. G. Elphinstone and Mr. MacLeod) had 200 acres coffee; and for the first time "Logie" and "Belgravia" appear in Lower Dimbula with 450 acres of coffee between them, Mr. Elphinstone having a half-share in each. We may now go on a decade, during which our old staple "coffee" continued to flourish and rise in estimation, notwithstanding that an "insidious defunction" was at work, in the leaf fungus all this time. In the Directory for 1876-78—when coffee had reached its maximum of prosperity—the names of Sir James Elphinstone and his son, as whole or part owners, were found opposite 32 properties in the districts of Ambagamuwa, Dimbula, Dolosbage, Kotmale, Matale East, Nuwara Eliya, Sabaragamuwa, Walapane Lower, and Yakdessa. The total acreage included was 14,468, while the planted portion covered 8,639 acres. This must have represented a money value of nearly half-a-million sterling at the time! By 1883-84, the return made a total of 12,124 acres; planted 7,714 acres. But by 1887-88, it had fallen to less than a dozen properties, aggregating total 8,010 acres; planted 3,665 acres; and in our volume for 1898-99, the name of Sir G. H. D.

Sir James Elphinstone amongst the Planters.

Elphinstone, Bart., occurs opposite the Westhall Group of three estates, 2,587 acres, of which 1,170 are cultivated, all in tea; and of Lady Elphinstone for Logie, Dimbula, 300 acres, with 282 in tea.

Sir James Elphinstone re-visited Ceylon in 1869-70 when his son was in full flow as Manager of the old properties, besides opening estates of his own. From the *Observer* of January, 1870, we quote a graphic description (also by "Old Colonist"), which carries its own story :—

THE GREAT HARVEST HOME BANQUET AT KADIANLENA.

One afternoon some eight years ago a knot of burly farmers might have heen seen gathering aronnd the quiet country inn of Pitcaple in Aherdeenshire, their ohject being to meet and bid farewell to the son of a distingnished neighbour, who was about to proceed to and push his fortnne in a foreign country. G. Dalrymple Elphinstone was, we helieve, withont one dissentient voice, the acknowledged favourite of the parish, his "weel faart" face ever beaming with fun and kindness as familiar in the panper's cot as in the Ha' and while always adding to the scanty stores of the auld widow wives, he never failed to increase his own stores of racy anecdote with which he has ever since been brimful. Great were the lamentations when it became known that "Graemie," as he was familiarly called, had made up his mind to go to Ceylon, and many a lonely auld wifie at the "fit o' Bennochie" felt that she was losing her best friend. The farmers in Aberdeenshire are hy no means very demonstrative in the respect they show for their "betters," but even they were not blind to the worth of young Graeme, and determined, before allowing him to leave, to invite him to a dinner at the inn—many a hearty shake did his hand get and many a sage advice did he receive. The chairman, we rememher, waxed eloquent, and told him that.

"The rank was but the guinea stamp" not to rely anything on the mere stamp, but on his own energy and the blessing of Heaven.

Five weeks after this our athletic young friend found himself in the Central Province of Ceylon, his huoyant spirits somewhat damped by the first impressions. Coffee Estates, even in those latter days, were very differently worked from what they are now. Agents, like attorneys in the West, had not yet begun to discover that the interests of their constituents were identical with their own, and consequently it too often happened, as in this case, that valuable Estates, instead of being a source of profit to the owner, were only a source of annoyance and loss.

Mr. Elphinstone was not long to be discouraged, he saw the cause and discovered the remedy. Fignratively and *practically* he put his shoulder to the wheel, and the result we now see to-day in old Baharundrah, which has tripled in value and productiveness, while by mere dint of hard work, prndence and economy he has added field to field and estate to estate till he is now one of the largest and most prosperous proprietors in the country. The coffee on "West Hall" now shows as deep a green as the sombre ivy on the turreted old castle of its namesake—"Logie" as much the centre of a highly prolific district as the family mansion in the centre of the Aberdeen Granary, while "Donside" smiles sweetly amongst the beautiful river-side patnas. These promising young properties have this year given their bumper crop, which having heen successfully stored, the event has been celebrated in a manner never before attemped in the jungles of Ceylon.

THE DINNER.

It was only on New Year's day that it occurred to the worthy proprietors of Logie and Donside, Messrs. Elphinstone and McLeod, to celebrate the snccessfnl storing of a good crop by a Harvest Home after the good old Scottish style, and no sooner did it occur than it was settled for the 7th and set about with their characteristic energy. 100 invitations were set afloat, and the services of that veteran purveyor, Mr. Hudson, enlisted, as well as the king of appoos, old Francis of Kandy—both of whom did their respective duties in the most creditable manner. The dinner was laid in the Upper Flat of the Kadianlena Store, richly decorated for the occasion by the ingenuity and taste of Mr. Allan, surveyor. "Wellcome all" in large capitals was capitally painted over the entrance, while snch mottoes as "We are a hand of brothers," Let Kotmalie & Dimboola flonrish," "Lanka for ever!" &c. &c. adorned the walls. At eight o'clock, some seventy gentlemen sat down to dinner, the chair being occupied by Sir James Elphinstone, on a visit to his son. Amongst those present we ohserved the whole of Kotmalie and Dimhoola; Mr. Dawson, O. B. C. Kandy; Mr. Sinclair; Mr, H. L. Forbes; Mr. Charles Grant, &c. &c., and amongst the clans represented in the Highland costume we observed conspicnons the "Forbes" and McLellan." The hosts sat at either end of the table: to those who know *Kotmalie*, the hospitahility of Messrs. McLeod and Elphinstone and what the Ceylon Hotels company *can* do, it is needless to speak of the entertainment. The table literally groaned with a superabundance of the good things of this life, while "Mum's" flowed as freely as if drawn from yonder sparkling waterfall.

Before the covers or viands were removed, the CHAIRMAN, in accordance with the good old cnstom, proposed the nsual loyal toasts, followed by "God save the Queen," "God bless the Prince of Wales" and "Rule Britannia," which were rendered with snch spirit and effectiveness as we have never hefore heard equalled in Ceylon. The following toasts were then proposed and most enthusiastically responded to:—

"Sir Hercules Robinson" hy the CHAIRMAN.

"The Army and Navy" by the CHAIRMAN. Captain OLDFIELD replied.

"The Coffee Enterprise in Kotmalie and Dimboola," hy Mr. McLEOD. Excellent original song hy Mr. Allan, Mr. HOOD replied.

"Our Joint Host" Mr. McLeod by Mr. SMITH.

"Our Joint Host" Mr. Elphinstone, hy Mr. MORRISON.

"The Mercantile Interest by the CHAIRMAN. Mr. DAWSON replied.

"The Chairman" by Mr. TYNDALL.

'The Ladies" by Mr. McLeod. Mr. ANDERSON replied.

We regret much not being able to give the speeches in detail, all of which were above mediocrity. In Sir James we of course had a great acquisition;—looking the very picture of health and soul of happiness himself he threw a geniality over the whole company which was reflected on every countenance. He gave a very graphic and interesting account of his first acquaintance with central Ceylon, now 24 years ago: hcw he wended his way np from Colombo, got as far a Passhagey, how he met a blnff looking European whom he accosted with the hope of getting some information regarding the locality of his land, "I don't know where the d—l your land may be," was the reply, "but if yon go up yonder hill you'll find an Elephant track—keep along it over the hill and down the other side you'll he somewhere near it." "Following these very definite directions," continued Sir James, "I plodded on, arrived at the ridge of the mountain and had just got into the Elephant track I remember when, out shot an Elk (here Craigy Lea hecame intensely interested). I scrambled down through the Forest and arrived at the patna knoll below ns. There I looked hack and saw I had got a good ridge to shelter me from the S. W. So I set to work there and then and built me a hut. I lived chiefly on jaggery and fungi and I did not relish or long remain in Kotmalie then, simply because I could

not get enough to eat, and had any one told me them that 24 years hence I would see some 70 intelligent-looking gentlemen sit down to dinner in this spot I would have simply said, "You're a fool!" In reply to the tremendous enthusiasm with which his health was drunk, Sir James delivered a most eloquent speech, in which he pictured a bright future for Ceylon, he repeated his views on the Galle Harbour question and urged that the cosmopolitan spirit be carried out. "Why," he says, "we are not a colony of paupers, let us pay our way as gentlemen and demand that we be treated as such." As to the Coffee Enterprise, he was delighted to see it was now in so good hands; he admired the energy, the prudence, the honourable feeling which prevailed, exhorted all present to continue in the same well-directed course—when the result could be no other than honour and independence. As for himself, he said, he was now becoming an old fellow, in all human probability within a few years of the end; he could not hope to revisit Ceylon again, but so long as he did live he would retain a lively interest in the country and those whom he had met here.

Mr. McLeod made a long and excellent speech, giving his experience during the last 20 years, which was highly applauded, while Mr. Smith quite excelled himself in his oration in praise of our worthy, joint Host, for whom he entertained the highest possible respect as a planter, as a gentleman and above all as a great hunter.

Mr. Morrison, in a neat speech, remarked that it must be very gratifying to Sir James to find his son here in the splendid position he had raised himself to in so very short a time. No man ever more deserved to succeed—he had shown us all an example in energy and judicious estate management. Not only figuratively but practically he had put his shoulder to the wheel and had achieved a success which had seldom been equalled in Ceylon in so short a time; he looked upon him as a great acquisition and honour to Kotmalie.

Mr. Elphinstone's reply was a very humourous one, he said "Although I can yarn to any extent in private I am an exceedingly bad hand at a public speech. I cannot but thank you, however, for the very enthusiastic manner in which you have drunk my health, although Mr. Morrison has said far too much in my praise (cries of No, no) and made too much of the little success I have attained in Ceylon, the largest share of which ought to be awarded to those who have so well assisted me in all my undertakings. I have indeed been exceedingly fortunate in my friends. Ever since I set my foot in this country I have met with nothing but kindness. I am delighted and proud to see so many of you here to-night, and as I have just been remarking to my friend on the left I do not remember in the course of my life ever having seen so many intelligent looking faces at one table and I feel proud to think, gentlemen, as I look around that you are not merely acquaintances *but friends*. I feel that I entertain the sincerest friendship for you all individually (cheers.) Mr. Morrison has made allusion to my putting my shoulder to the wheel. I am constantly hearing of this in the newspapers and elsewhere. Well, I *did* put my shoulder to the wheel, and I'll say this much, I'll back myself against any planter in Ceylon to drive a bullock cart. (cheers!)

The Ball.

Shortly after 12 o'clock, on receiving a hint from the Chair, the company rose from the table and in five minutes the whole debris was cleared away. Mr. McLeod "blew up his chanter" and played a Highland reel with great spirit and taste. Sir James opened the Ball by dancing a reel in which he showed such agility as would be creditable to one half his years and led us to hope we would yet see him back in Ceylon after many years hence. Some half dozen excellent amateur violinists now screwed up their strings and struck up "The Reel o' Tulloch. The company became electrified and the result was something to be remembered. Seventy stalwartmen rose *en masse* and danced with such tremendous vigour that not only did

"Roof and rafters dirl"

but Mr McLood cast many a wistful look at his beams, pricked up his ears, and seemed to think the company

"Had nae other thocht than how to kill"

themselves in the shortest possible time. Gradually matters subsided a little. Still the only difference seemed to be that the company had resolved to kill themselves more orderly. Reel followed reel for three hours, varied only by a country dance and a half-hearted polka, some excellent singing then took place in which Messrs. Elphistone, Allan and Martin particularly distinguished themselves. Mr. Martin's "*Spinning Wheel*" was capitally rendered and brought down thundering applause. At half past three the company adjourned to supper which was done ample justice to, and followed up by some beautiful sentimental! songs by Messrs. Grant, Smith and others. The "Bonnie Woods o' Craigie Lea" was a great success. But all were impatient to return to the dance and dance they *did* with unabated vigour till —tell it not in Gath—*gray daylicht*. The band which discoursed such excellent music was conducted by Mr. Grant who was occasionally very ably assisted by Messrs. Smith and Martin. The whole passed off most harmoniously, every body seemed delighted with himself and everybody else, and all seemed to agree that such merry making, when prudently conducted as this had been throughout, was more conducive to unanimity and good fellowship in a district than all the meetings ever held in connection with the P. A. We had almost omitted to notice the splendid fireworks, which seemed to be a source of much amusement and wonder to the natves. These went on, or rather went off, at intervals during the night, but the grand display was reserved for morning's just before dawn.

Our first recollection of "Logie" was in 1869 when travelling round the planting districts, collecting, for the first time, the *planted* acreage of estates. We were visiting the late Mr. John Forbes MacLeod on Kadienlena estate and meeting all the men in the district; we were made specially welcome on Baharundrah where we had evidence of the untiring industry and spirited enterprise of the young Manager. Mr. Elphinstone was then the beau-ideal of a handsome young Scot: he had had a business training in the Oriental Bank before coming to Ceylon; but it was agricultural experience at home and fondness for work that stood him in good stead. To be able to check the native cartmen—usually considered at the time to be great rogues in overcharging and also in stealing or mixing coffee *en route* to Colombo—Logie made a whole trip himself as bullock-cart driver from Kotmale to Colombo *via* the Kelani Valley, living very much as the cartmen did, roughing it right through, and so got to know more than any other man in the island about the real cost and risks of cart transport. A riding party was quickly formed during our visit, by Logie and MacLeod to visit "Dimbula Felix," Wm. Smith and Craigie Lea and "the Colonel" (Mr. Hood) on Talawakele. Logie estate was then considered the *ultima thule* of the district, there being no cart road beyond Mount Vernon; unbroken forest between Forest Creek and Dikoya, and Louisa

and Nuwara Eliya; while Wm. Smith declared all beyond the Lindula patanas and towards the Agras—where now are found some of the richest plantations in Ceylon—as only fit for hunting purposes! We need not say how large a part Sir, or as he was then Mr., Græme Elphinstone had to do in "pioneering" beyond Smith's limits, or how ready he ever was to give a helping hand to a poor neighbour, or even to become partner with a friend trying to get on the ladder of proprietorship.

The career of the worthy Baronet as planter here, is but an epitome of many a similar experience in Ceylon connected with the "rise and fall" of the Coffee enterprise. The hard hing in connection with Sir Græme Elphinstone is that, while he was one of the first to foresee what was coming and to pioneer with "tea," he was not allowed to reap the reward of his foresight; and properties were taken away, even after being planted with the new product which, if they had been left in his hands, would have cleared all burdens, and become splendidly remunerative estates for the man who first planted tea.

Still it may be said of Sir Græme Elphinstone that in Ceylon he did better than achieve success —he most fully deserved it. No man ever more so: a planter among a thousand—hard-working, never idle indeed, cheery and generous and a chief among good men.

When the end of the Ceylon career came, and Sir Græme had to return to England, he, for some time, interested himself in making Ceylon tea known and in the establishment of a London distributing business. In 1894 he was elected Ceylon Planters' delegate for tea in America and was much pleased at the confidence placed in him —sending us a letter conveying his thanks to brother planters and fellow-colonists; but other business in London and the country at the time prevented his actually going to America. After a period of rest in Cheshire, the old longing for a useful and therefore planter's life in the tropics overcame "Logie" and we have a letter before us dated "Straits of Malacca, ss. 'Khedive', 11th Dec., 1895," in which he stated the possibility of his settling down on Waterloo estate, Perak, of which he was part-proprietor. He had travelled out viâ Canada, Vancouver and Japan and the immediate purpose of his writing—characteristic of the man—was to enlist our sympathy on behalf of a young ship's officer who had fractured his leg and of whom "Logie" had heard as lying in Colombo Hospital (although he had left for home before we got the letter and called). We do not think Sir Græme has been home since 1895, so that he has now had another spell of well-nigh five years of tropica work and when last we heard from him he was going in for the cultivation of a variety of new products, sending for all our Planting Manuals in order to refresh his recollections of what had been done in Ceylon. Here again, we may not be able to chronicle a brilliant success for Logie, but that he has done his part well, there can be no doubt:—

'Tis not in mortals to command success;
But we'll do more, Sempronius; we'll deserve it.

It only remains now to notice the portraits presented with our present issue. That of Sir Græme Elphinstone is good and characteristic and will give pleasure to his numerous friends. In the other we have a veritable "leaf from the past," for Sir James Elphinstone in the centre, in contrast with two of the youngest members, one on each side, is surrounded by the company assembled at the Kadienlena Harvest Home of Jan., 1870, reported above. The group may be said to be historic including many District pioneers like J. F. MacLeod, Wm. Smith, Humphrey Humphreys, John Tyndall, John Martin, "Colonel" Hood, "scientific" and genial Heelis, "Cheetah" Morrison, Jas. Wight, John Stronach, Hugh or Wm. and James Bisset, Wm. Allan (Surveyor), F. Hudson (Purveyor),—while "Logie" and Arthur Sinclair kept in the background. This is one of the best photographs ever taken by Humphreys (who is among the few survivors, now a hearty British farmer) and well reproduced by an Aberdonian Firm. But of the great majority what can we say, alas! save in poor Charles Lamb's lines:—

The old familiar faces—
How some they have died, and some they have left us,
And some are taken from us; all are departed;
All, all are gone, the old familiar faces.

JADOO.

(To the Editor, "Tropical Agriculturist.")

EXETER, 18th Jan., 1900.

DEAR SIR,—Our attention has been called to a reply that appeared in your issue of December 1st to a letter from a correspondent at Kandy, with reference to the use of Jadoo Fibre for strawberries. Will you kindly permit us to say that it has been proved practically *impossible* to "wash out" the properties of Jadoo Fibre even when exposed to tropical rain. As to its use for strawberries it is being taken up on a large scale for use with them in the open ground in Cornwall this year. And if your correspondent will apply to Mr. Batho of d'Hautier Gardens, St. Saviour's, Jersey, he will, we know, tell him that an enormous increase in crop has gained by him last year by using Jadoo for strawberries besides getting a much better price for the fruit in the Covent Garden Market than he did for what was NOT grown in Jadoo.

With regard to what you say about Jadoo having proved a failure for use in nursery beds for Tea and Coffee, you will perhaps allow us,

to say you are entirely mistaken. We have never heard of one single instance where it has failed in being a complete success for *nursery* purposes ; in fact, its root-forming properties are invaluable for that purpose. Unfortunately planters in very many cases, overlooked the fact that its use was being recommended for *nursery purposes only*, and because it was too expensive for use with old trees, condemned it and others hearing this jumped to the conclusion that it was a failure for seed beds also.

We hope hereafter to be able to reduce the cost so as to bring it into use for manuring old trees, but at the present price it is quite within the reach of every planter for nursery purposes as the freight has been greatly reduced owing to improvement in mode of packing Jadoo for export. —Yours faithfully,

C. HALFORD THOMPSON,
Chairman, Jadoo Limited.

[Our information was entirely from practical men.—Ed. *T.A.*]

PULVERISING THE SOIL.

The value of pulversing the soil repeatedly is not generally understood by farmers who cultivate large areas of land, but the market gardener, who has only a small space on which to make a living, shows by his methods that he realises the importance of this work. Incidentally, pulversing the soil means good culture of plants, but plants can be cultivated and the soil may not be pulverised. The finer we pulverise the soil around plants the better is the mechanical condition of the soil for making the plants grow and resisting dry weather. When we study the subject from a scientific point of view, we can understand better the effects of what is good culture. Everybody in this age understands the theory of the evaporation of water from the soil; how the water rises from the subsoil or underground springs by capillary attraction, and, if not taken up by the plants, passes off into the air. This evaporation begins on the surfaoe, and extends gradually downward. If the soil is too thick and compact the moisture has difficulty in drying up, and the top layers dry very slowly. Such land is usually wet and muddy in ordinary rainy weather, and it is unfit for crops. In order to facilitate capillary attraction, the soil must be so pulverised that the air spaces in the soil are small. This enables the soil to rise gradually and continuously. By good cultivation on the surface the plants are kept well supplied with moisture all of the time, and every fresh stirring of the top soil starts up new reservoirs of water from the subsoil.

Gardeners have what they call a dust mulch, which is simply another name for good, thorough surface cultivation. They stir the soil around the plants every week or few days, and the soil becomes so thoroughly pulverised that capillary attraction is in rapid progress all the time. It has been demonstrated that, on the right kind of soil, garden plants can in this way be brought through the driest weather imaginable, and without a drop of water artificially supplied. The dust mulch is better for the plants than an artificial one of leaves and litter, although the latter are not to be neglected where it is impossible to give the thorough pulverisation required. This stirring of the surface soil is more important when the plants are young than when they get half grown. Then they shade the ground around the roots, and form a protective moisture holder that helps them through the hot weather. After all, it is the young immature plants that we have to care for and tend, and, if we succeed in getting them started aright, the crops are pretty well assured.—A. B. Barrett, Minnesota.—*Agricultural Gazette*.

PRESERVATION OF STABLE MANURE.

In a paper read before the last annual convention of the Cheese and Butter Association of Western Ontario, Mr. Frank T. Shutt, M.A., Chemist of the Dominion Experimental Farms, Canada, took up a subject which is of the greatest importance to farmers who wish to get the best results from their stores of farm-yard manure. After showing how necessary it is that farmers should make themselves acquainted with the nature and composition of manures produced by the different classes of live stock, and the conditions and influences that increase or decrease the fertilising value of it, Mr. Shutt detailed certain experiments recently carried out at the Experimental Farm at Ottawa in connection with the rotting of manure. In this experiment or investigation the principal object was to learn what losses took place in nitrogen, phosphoric acid, and potash during the rotting of manure under two conditions —*(a)* manure completely protected from the weather, and *(b)* manure rotted in an open bin, using all ordinary precaution against undue leaching. Secondly, to learn the result of fermentation upon the availability of the plant-food in the manure. This is an important question, for it is quite possible to have the soil loaded or saturated with the elements of plant-food, nitrogen, phosphoric acid, and potash, but so combined that they are of comparatively little value to growing crops, that is to say, are not soluble in water. We are all aware that the nourishment crops take through their roots must be in solution. Plant-food to be available must either be in solution or soluble in the slightly acid sap which roots exude. Plant-food in other forms than these is not available for our growing crops. For instance, in various parts of Canada phosphate of lime or apatite is mind. This mineral phosphate, no matter how finely it is ground out, is useless (because insoluble) to growing crops. It had been tried and that conclution had been reached after several years of experimenting. But treat this mineral phosphate with sulphuric acid, and it is converted into super-phosphate, a most valuable, because soluble, source of phosphoric acid for crops. It was desired to learn therefore whether fermentation under the conditions names affected in any way the availability of the plant-food in the manure.

Eucalyptus Leaves.—A farmer in New Sout Wales claims (say the *Australasian)* to have discovered a new use for eucalyptus leaves. The discovery is certainly a valuable one if it be found as effective in practice as it is stated to be. The gentleman referred to asserts that if fruit trees are mulched in the season of rest with eucalyptus leaves they will be entirely free of blight or fungi of any kind the following season. His own practice is to gather all the gum-tree leaves within reach, and if necessary, cut down eucalyptus branches, and spread them over the orchard. If this plain is regularly followed, he states that the fruit trees will be completely protected against scale of fungi of any sort. I have not seen the trees which the owner declares to be thoroughly free from the pests mentioned, while others close by, and not so treated, are almost worthless, but I have every confidence in recommending others to give the remedy a trial. The discoverer is a practical fruit-grower, and knows what he is talking about. He further advises that all orchards should be sheltered with eucalyptus instead of other deciduous trees, which act as a breeding ground and harbour for the insect pests which so annoy fruit-growers. There seems to be a good deal of reason in these suggestions. The eucalyptus trees, it has often been observed, are remarkably free of disease of any kind, and the pungent oil in their leaves very probably does contain some property that is repulsive or fatal to the insects and fungi which infest our fruit trees with such disastrous results.—*Journal of the Jamaica Agricultural Society.*

NEW AND OLD PRODUCTS IN ZANZIBAR.

(*Concluded from page 448.*)

Approximate yield per tree.—The number of clove trees at Marseilles was stated to be 5,000, but on recounting we found there were 7,500 bearing trees at Marseilles and 1,000 at Kitumba—together 8,5C0. On December 31st we had gathered, approximately, 1,300 fraslas, and might, I think, safely count upon another 300, making a total of 1,600 fraslas. This gives an average yield of over 6½ lbs. per tree. A good proportion, abont one quarter, was left upon the trees ungathered through lack of labour. With sufficient labour we should, I think, easily have reached 2,000 fraslas; the approximate yield per tree is therefore brought up to over 8 lbs. The trees at Dunga were just as heavily laden with buds, but they never ripened properly; at least half the crop failed. We reached abont 350 fraslas, which from 3,000 trees gives an average of 4 lbs. per tree.

Returns.—Our actual sales at the end of December amounted to 873 fraslas which realized 5,535 rupees, while we had on hand at the custom house unsold and in the plantation godown an estimated quantity of 424 fraslas which, valued at the current rate of 5½ rupees a frasla, was worth 2,332 rupees. Our gross returns np to December 31st may therefore be taken as R7,867. Our expenditure to that date was 1,725 rupees, or about 22 per cent of the gross returns, and onr net profit is shewn as R6,142.

ACCOUNT STATEMENT TO DECEMBER 31st.

		R.
873 fraslas sold	..	5,535
424 „ (approx.) on hand	..	2,332
1,297 fraslas	Total ..	R7,867
Expenditure to December 31st	..	1,725
Net returns	..	6,142
	Total ..	R7,867
	Net returns ..	R6,142

This is equal to a net profit of 4 rupees 11 annas per frasla.

The amount 1,725 rupees as the actnal cost of gathering 1,297 fraslas works out to 1 rupee 22 pice per frasla and differs slightly from my first estimate of 1 rupee 13 pice. This discrepancy may be accounted for by the alteration in the rating, which was at first per 300 pishi: I wanted the headmen etc. to receive a fair but not an excessive wage; bnt as the season advanced I fonnd that I had nnderestimated the daily pick, which was about 400 instead 300 pishi, so I altered the rating accordingly. The spreaders were allowed 3 pice each per day, bnt at Kitumba where the quantity of cloves to handle was proportionally mnch less, the spreaders were paid at a higher rate. This would introduce another slight error into the first calculation. The whole of the Kitumba staff of headmen etc. should in reality have been rated differently, but this would have led to confusion in the accounts which were kept by an Arab who, admirably as he did his work, was not familiar with European methods of book-keeping. For tho same reason I abandoned at Machni the idea of paying the pickers at the rate of 4 pice for every pishi picked after the first six. Where supervision is diffionlt as it is in clove picking, this system would most certainly have led to imposture by the people. It wonld, for instance, have been easy for two or three to have nnited their day's gatherings in order to make up the required quantity for the extra pice. At Dunga, which was I believe the only place where the system was adopted, we had not a sufficient amount of cloves to judge of its efficacy.

The net returns to December 31st are then shewn to be R6,142. Allowing now for the estimated 300 fraslas still to piok and valuing them at 5 rupees a frasla, the price to whioh cloves subsequently dropped, the total net returns are increased to R7,245.

ACCOUNT STATEMENT FOR THE SEASON (APPROX.)

		R.
Net returns to Dec. 31st.	..	6,142
300 fraslas at R5	..	1,500
	Total ..	R7,642
Cost of gathering 300 fras. at R, p 22.		397
Balance profit	..	7,245
	Total ..	R7,642
	Balance profit..	R7,245

Rupees 7,245 from 8,500 trees is equal to an income of 13½ annas per tree.

The waste upon the trees which I have estimated at one quarter of the crop would, if collected, have sufficed to pay for the entire expenditnre. My object here however is to compare our aotual expenditure and receipts and to arrive at a fair estimate of what a clove plantation may be expected to yield. The unpicked surplus is, therefore, better left out of account. Treated thus it will help to neutralise the effect of basing our calculation upon an abnormally large crop.

Our cloves were not subjected to the usual 25 per cent export duty.

This reduces the income per tree to 9½ annas; or R54 (£3 12s.) per acre: 90 trees to the acre.

Cost of Working a Clove Plantation.—Beyond purchasing drying mats and paying the harvesting expenses, the Arab spends little or nothing upon his clove trees. He employs his available labour, for the most part, in growing manioc, sweet potatoes and bananas for food and for sale. Thus the resident Arab in charge of Marseilles, when we took over in May, was expected to make 34 rupees a month by the sale of fruit and annuals, and was in consequence compelled to keep his men cultivating the open spaces and to leave the trees alone. This is a fair sample of Arab practice; it is a policy of looking after the pence and neglecting the pounds. The weeds on this shamba were half way up the trees, in some cases climbing completoly over them; many were dying and 1000 had been killed outright. It cost us R5 per acre to clear the land reckoning 90 trees to the acre. We let out contracts giving fonr pice of each space between fonr trees. When the land has been once or twioe thoroughly weeded over, the cost of cultivation will be much reduced. In addition to cleaning the land we hope this year to dig ronnd each tree at a contract price of probably 1 or 2 pice per tree. At Dunga we are now doing this work with two mnles and a plough. Drying mats cost 30 rupees per 100 and baskets 3 rupees per score; 800 of the former and 100 of the latter were purchased for use at Machui, bnt at least half of these will be available for use again next year. There are no other outgoings to note beyond the overseer's wages, the purchase of a few dozen hoes, and items such as thatching and repair of houses and sheds always incidental to the management of an estate.

It seems to me indeed that clove planting as an industry has been somewhat unworthily discredited. Over-production and the labour crisis have brought about the stagnation of all enterprise, but I believe that clove planting in Zanzibar would respond to European management and proper cnltivation. The production of cloves must decrease as years go on, as no yonng plantations are being made to supply the waste among the old treos. Such a year as this must exact a heavy toll; the enormous yield, coming as it has done in a year of drought, will exhaust the trees, while the drought itself will have killed off many thousands. It will always be to the interest of Zanzibar, if not to overproduce, at least to keep the markets well stocked in order to keep out opposition and preserve the monopoly. As long as the monopoly is maintained the clove industry will never hopelessly degenerate in the way, for instance, that sugar planting has.

Maltreatment of the trees.—The rough handling which the trees receive during picking is a very serious

evil and one difficult to check. The shamba people are as bad as, if not worse than, the outsiders and seem to have been trained npon careless and destrnctive principles. To be too strict in the matter is to run the risk of yonr wageni pickers deserting to other shambas where they will not be molested. It is the buds upon the tops and the lateral extremities of the boughs that are so difficult to reach, and at Machni we were compelled to leave those. At Dnnga where we had snfficient lahonr to keep half a dozen ladders going we did not sncceed in thoroughly clearing the trees. Three men working one ladder will hring in 6 pishi a day; it would therefore have heen unprofitable to have diverted the lahour, where it was scarce as at Machni, from the accessible bnds to the ladders where three men conld only pick the equivalent of one.

Another frnitful source of trouble is the ravages of the *maji moto* ants, which weave their nests in the branches and are sometimes so bad that pickers cannot climb the trees till they have first smoked them out by lighting a fire nnderneath. When this takes place the lower hranches of the trees are frequently singed and the trees sometimes fired altogether. The ravages of *maji moto* ants can be kept nnder by weeding. Well-weeded shamhas are seldom trouhled much with ants.

Experimental drying of the Cloves at Dunga.—Both Mr. Robertson and myself have given a good deal of attention to clove drying. We studied the Arab methods and fonnd that they almost invariahly heaped up their green cloves in the godown the first night after they are picked. If the weather is showery, preventing drying, the heaps remain for several days, growing larger with each day's picking. Fermentation is in this way set up, the cloves emerging a rich brown colour. It occurred to us that as this colonr approached the rich tan colonr so desirahle in the dried clove that a properly controlled system of fermentation might be heneficial. But our experiments showed this idea to he erroneous; cloves shonld be spread ont immediately npon being measured in; heated cloves turn black. We trained onr people to separate the burst from the good huds while stalking. It can be done at this time with little trouhle and with no extra cost, but the invariahle custom is to let good and bad all go in together. Before finally sending to market we passed the cloves through a riddle to remove the small immature bnds. By these means, which is only the old story of attention to detail, we produced what, for Zanzibar, was a fairly good sample, though falling short in the size of the buds. This was a defect which we could not remedy most of the cloves this year have been small.

Practically no difference is made in the local market between good and ordinary, so I was induced to send a small trial lot of 140 fraslas to be sold separately in London, to test the value of our work. Early in the year I had sent home to Messrs. Gray, Dawes & Co. an experimental sample of cloves that had been dried last season, and Mr. Hugh Garden of that firm reported on them as follows:—

"As regards the cloves this is of course the finest sample of Zanzihar ever shown, and buyers who saw it valued it at seven-pence to eight-pence. There is still a considerable difference between this and Penang which, somehow, appear to retain their reddish brown colour. A very fine sample was bonght in at anction at eleven-pence or eleven-pence half-penny, and was heing held for one shilling. The market apparently makes the same difference between Penang and your sample—in value—as between your sample and ordinary fair Zanzihar, but this too you must understand is only for very limited quantities."

These cloves were dried under glass after having been specially picked. More depends upon the picking than npon the drying. It is impossihle for us here to pick the buds singly because of the quantity to handle; they mnst he picked in hnnches, as they grow, and the small and over-ripe buds sorted out afterwards.

In order to test the efficacy of glass we erected small house 30 feet long and 14 feet wide with galvanised iron walls and a glass roof. The heat of the snn was in this way increased 25° heyond what it was in the open air. This increased temperature did not hasten the drying process so mnch as we expected nnless the cloves were first raised upon shelves. The heated air was then ahle to act from helow and ahove, and cloves could he dried in two days in cloudy weather with only short intervals of snnshine. All our cloves were finished off in the glass house. I don't think that the elevated temperature to which they were exposed contrihuted so much to the improvement in quality as the sorting and riddling. We shall try and arrange next year a system of shelves to increase the drying area of the clove honse. Onr experiments have, however, shown that cloves must he exposed to the direct heat and light of the sun; if dried in the shade they tnrn hlack.

The glass house has heen the means of saving lahour as the cloves, once spread ont in it, could be left to dry. Much time is lost, at a time when every available man is required for picking, under the present system of taking the mats in and out morning and evening and in showery weather. At Marseilles this hecame most serious as we had hetween four and five hnndred mats to handle each time.

The Clove Crop generally.—The magnitude of the clove crop may be judged hy the returns for Novemher and Decemher. In those months Pemba sent in more cloves than in any previous month of the years tabulated, while the total for the two islands for Decemher, namely 121,858 fras. exceeds all previons returns. The Zanzihar crop was late, hence the total of 60,365 fras. for the year is the lowest since 1890, though the ports for December, namely 32,399 fras., is the highest on record for Zanzihar in one month. Still a heavy loss has taken place npon the trees. The dry weather of December, the rainfall for which was the lowest on record, following npon an unusnally dry year, caused the trees, especially in the districts where the crop was very late—Dunga, Kitnmha and the north end of the island—to shed starved and immature hnds, and lahonr was diverted from picking to sweeping up the fallen cloves under the trees. A qnantity has heen gathered in this way though a far greater quantity has been lost. Picking in these districts never really got into fnll swing.

In the Machui district the crop was ahundant and well forward, hut the lahour was totally inadequate to cope with it. The trees look as heavily laden now with ripening mother of cloves as they did in the heginning of the season with hnds, and the proportion picked must he quite insignificant to that which is left. In the South Mwera country the crop was earlier and lighter and was comparatively well gathered. Pemba seems to have snffered less from the effects of the drought than Zanzibar. The soil of Pemba, having more clay than onrs, is more retentive of moisture, and therefore hetter ahle to resist the effects of dronght. The Pemha trees, too, are older and their roots will consequently have reached deeper levels for their food snpply.

III. COCONUTS.

The Dnnga trees yield ahout 30 nuts per year, and the Machni, which are older, 40 nuts. Gathering has cost with ns ahont 4 rupees per thousand nnts, and the nnts can he sold on the spot for from 20 to 22 rnpees per 1,000; there is therefore a profit of say R17 per 1,000. Now a thonsand nuts are the prodnct of 33 trees, at 30 nuts per tree. Trees are planted 35 feet apart which is 35 trees to the acre. Roughly then we may take it that 1,000 nuts are the produce of an acre of land and give a net return of R17 (£1·2·8) per acre of half a rnpee per tree. There are no other ontgoings to he charged to coconuts as the trees are not cultivated in Zanzibar. Mr. Last has more than trehled the yield of his trees at Mangapwani, which he attribntes to having dug the ground round them. We find at Dunga that digging and mulching with grass can be done for ahout 3

pice per tree; the margin of profit, therefore, as shown by Mr. Last's figures is euormons. In addition to digging and mulching with grass we scatter a little Latham island guano or lime around each tree.

The coconut industry stands well with the European markets and seems, like rubber, to have an assnred future. Coconuts form a staple article of food and common utility; their cultivation must be confined to the tropical littoral, and cannot, like tea, coffee and cocoa be extended to the interiors of Africa and South America as these become opened up. I believe that the planting energies of this Island, seeking an outlet, could not be better directed than to the cultivation of this tree which is simple and inexpensive, while the profits are assured.

We have not as yet been able to make any definite experiments in copra drying. In consequence of the crude methods in vogue we have found it more profitable to sell the nuts on the spot than to make copra. We intend this year to utilise the new glass-roofed house for copra drying in the intervals of clove picking.

CHILLIES.

The small clearing on the coral of about 3 acres, which we planted two years ago, has gone through a second period of drought, and crops have been exceedingly light. All attempts to supply the gaps caused by deaths have been unsuccessful. We thought of abandoning the plantation as having shown conclusively that the cultivation of chillies will not pay here, but must be left to the Wahadimu; but in consequence of the abnormal seasons being scarcely a fair trial, we decided to keep the clearing on another year.

In August we submitted to Messrs. Gray Dawes & Co. some samples of chillies for report, and Mr. Hugh Garden wrote of them as follows:—

"I have received your letter of the 2nd inst. together with samples of chillies......Such a sample for Zanzibar has never been shown in this market, and if coming in small parcels I think they will realize ten to fifteen shillings per cwt. over ordinary Zanzibar fair. You must not forget, however, that it is only for a limited quantity that this premium would be obtainable Japan chillies, for instance, were fetching, I imagine, twenty to twenty-five shillings per cwt. more than Zanzibar at the time you were in London (1896). Last week Japans were sold as low as thirty-one shillings and sixpence, or practically the same price as the value of Zanzibar "fair," on account of increasing imports."

These chillies were dried in the ordinary way upon mats in the sun, but they were stalked and kept clean. Any native who chose to take the trouble could do as well. Chillies are often shed from the trees before being gathered, in which case they will have been weathering upon the ground and lost colour. The stalks are left on, and, in drying, the chillies get mixed up with soil and leaves, and often come in for a drenching on their way to market. The inference drawn from Mr. Hugh Garden's report is that if Zanzibar chillies received the ordinary care and attention that any white man would give them as a matter of course, they would command the highest price in the London market, instead of the lowest as at present.

BANDA NUTMEGS AND MACE.

By O. KAMERLINGH ONNES.

(*Concluded from page 491.*)

III. TRADE.

WAREHOUSING AND AUCTIONS.

When the nutmegs and mace reach the *Amsterdam* and *Rotterdam* markets by the steamers of the Dutch Steamship companies plying between Holland and the Indies, they are all warehoused in Bond, where they are gradually sorted by the sworn Spicebrokers.

Every case of nutmegs is opened, the worm-eaten nuts, if any, are thrown aside, whilst the contents are classified according to quality in Nutmegs: *Nos. 1, 2, 3, 4 and "Separate."*

Each case of mace is equally opened, the various qualities being designed Mace: *E., F., G., "Separate"* and *"Broken."*

Sales.—Every three months public sales are held in Amsterdam and Rotterdam, the first days of these sales alternating between the two markets.

Samples.—Samples may be inspected in the bonded warehouses daily during 4 or 5 days before sale.

Conditions.—The conditions of sale are: bids to be made in cents (Dutch) per ½ Kg., delivery within a fortnight discount 1½ p.ct., or within three months without any discount. Bids are only accepted through the medium of sworn brokers, who are bound to state name of buyer.

The large importers have lately sold their produce in public sale by auction, whilst a few others still adhere to the old system of selling under cover.

For each parcel of nutmegs or mace a dock-warrant is handed to the owner of the goods, which entitles him to remove the parcel at once or to leave it in Bond on the condition of 15 cents (Dutch) per 100 Kg. rent for warehousing, insurance included.

All banks will advance money on these dock-warrants.

IN THE FINANCIAL MARKET.

As nutmeg and mace, well stored, are not subject to deterioration they lend themselves easily to speculation when prices are low.

DELIVERY.

The buyer has a right to have each parcel weighed over again, but he seldom avails himself of this right. He is also entitled to have each case opened to inspect the contents, but it is customary to take the broker's description for granted.

Every buyer packs the goods in his own style and according to their destination.

TRANSIT FREE.

On leaving the bonded warehouses goods in transit are free of duty, but on parcels for home consumption duty is payable.

DUTY OFF!

With regard to the latter it has been proposed to take off the duty, which would be advisable as the amount of duty received is relatively small, and as it would conduce to an easier movement of the market if the goods could be warehoused free anywhere.

ADULTERATIONS OF BANDA AND NUTMEGS AND MACE.

Caution against Frauds.—The bad habit of our days of adulterating different articles of food, even when prices are low, has crept into the trade in nutmeg and mace far more than would be thought possible. *Fraudulent Mixtures.*—From the moment that the article was placed before the public in a ground state, under the pretext of

offering greater facilities and economy in the kitchen, unscrupulous caterers have not hesitated to mix the article with all sort of rubbish, which in many cases is decidedly injurious to the public health. *Detection of Fraud.*—Connoisseurs might detect the fraud either by the colour of the ground substance, showing a deviation in the shade, which ought to be a light brown, or by a pungent disagreeable taste instead of a pleasing aromatic flavour.

Caution against ground Substitutes.—In order to be always on the safe side the public should decidedly refuse the ground article and ask for the superior Banda nutmeg, which should be firm and more particularly round, whereas the inferior article such as the wild nutmeg and the New-Guinea and Borneo or similar lower class produce is of a long, oblong shape and entirely wanting in the exquisite flavour for which the real article is estimated so highly.

Other Frauds.—The deception practised upon the public does not even stop here, and lately *artificially moulded* nutmegs have come under our notice. The swindle of this kind may be detected by breaking the sham nut which does not show the characteristic graining of the real article, whilst the mark of the moulding always leaves some traces on the artificial nut.

Caution against other Frauds.—Repeatedly the nut has been robbed of its oil by Distillation (*sweating*), whilst the holes caused thereby have been filled up with sassafras. Buyers should beware of such fraud which may be easily detected by the light weight of the nut.

Swindle with Mace.—Lower class mace and other indifferent substitutes which are mixed with the genuine Banda, have been forced upon the public. Buyers should refuse inferior mace and flavourless dust.

SCIENCE *versus* FRAUDS.

Microscopic and Chemical Tests.—Besides the various tests mentioned, Science disposes of several means to detect frauds, and we are glad to say the sham article gets less chance every day to pass undetected.

IMPORT AND DELIVERY OF NUTMEGS AND MACE IN HOLLAND.*

NUTMEGS.

In case of 75 kg.

Year.		Import.	Delivery.
1890	...	—	—
		not	specified.
1891	...	—	—
1892	...	11149	12842
1893	...	15992	9399
1894	...	12411	12658
1895	...	13704	13693
1896	...	13377	12795
1897	...	15799	13531
1898	...	14215	11516
1899	...	*6 months*	*6 months*
half year		*6666*	*7193*

* 1890—1898 according to Brokers' circular, published by Mr. W. F. Westermann, Amsterdam,

MACE.

In case of 50 kg.

Year.		Import.	Delivery.
1890	...	—	—
		not	specified.
1891	...	—	—
1892	...	5143	5680
1893	...	8005	5114
1894	...	5616	4854
1895	...	5837	6605
1896	...	5725	5197
1897	...	5919	6366
1898	...	7702	5705
1899	...	*6 months*	*6 months*
half year		*2844**	*2348*

PRICES OF NUTMEGS AND MACE IN CENTS (DUTCH) per ½ kg.†

NUTMEGS.

Qual. 110—115 pieces per ½ kg.

Prices ruling from Jan.—Dec.

Year.				
1890	...	172	162	168
1891	...	162	153	159
1892	...	155	125	130
1893	...	125	115	110
1894	...	100	95	105
1895	...	102	105	100
1896	...	100	85	88
1897	...	86	85	86
1898	...	95	80	82
1899	*first public auction* 84			
	second „ „ 84			
	third „ „ to follow.			
	fourth „ „ „			

MACE.

Quality: E. F.

Prices ruling from Jan.—Dec.

Year.				
1890	...	174	163	172
1891	...	172	163	160
1892	...	150	140	130
1893	...	130	125	120
1894	...	100	115	110
1895	...	110	115	105
1896	...	100	90	95
1897	...	97	90	110
1898	...	120	115	110
1899	110—115 *first public auction* (estim.)			
	105—110 *second* „ „			
	third public auction to follow.			
	fourth „ „ „			

Price of Nutmegs in former years:

1840—1855 highest (in 1845) 286 cents (Dutch) per ½ kg., lowest (in 1843) 120 cents.

1855—1863 prices falling; lowest (in 1863) 60 cents (Dutch) per ½ kg.

1863—1872 prices going up; (1872) 203 cents (Dutch per ½ kg.

* As a rule mace appears earlier in the market being sooner ready for shipment than nutmegs.

† 1890—1898 according to Brokers' circular, published by Mr. W. F. Westermann, Amsterdam.

1872—1885 prices falling; 118½ cents (Dutch) per ½ kg.

1885—1890 prices going up; 165 cents (Dutch) per ½ kg.

IV.—USE.

The old German and the old Flemish songs almost identical in their opening lines, singing the praises "of the two little trees standing in my love's garden," are an instance of the secret poetical charm which things oriental have always exercised on the western mind. As Camoëns sang in the *Lusiad*, Heine in his *Lieder* on the Ganges, enriching literature with the glowing picture of oriental beauty, so in a more matter of fact way the most famous cookery books of olden days are redolent with the scent of the spices of the Indies.

This predilection for spices has not left the Flemish women yet, and their excellent kitchen recipes still do credit to the numerous piquant qualities of both Banda nutmeg and mace.

In fact we could hardly suppose a list of Flemish or Dutch *Wedding Presents* to be complete without a *nutmeg box and grater*, and for years a special present on the 6¼ anniversary of the wedding day called "*the Pewter-Wedding*" in Holland, has been a pewter spice-box. Fashion during many years too much under foreign influence, has made this typical present recede into the background, but wherever a young housewife considers herself the natural mistress of the kitchen, it is still an indispensable item of her wedding-wishes.

Of late the desire of being the personal attendant to her husband's comfort as well as his spiritual companion has drawn the Dutch woman's attention especially to the kitchen-department, and this good principle has been strengthened since, by the decided success of the *Dutch Cookery Schools.*

Although the days of mediæval opulence are irretrievably past, the necessity of good feeding is becoming more evident in these days of mental and bodily strain. Had children always being fed as ours are, many of the complaints of the generation which now peoples watering places and seaside resorts, would never have arisen, so we may consider it a boon that such institutions as our *Housekeeping and Cookery Schools* accustom the female mind to the ancient truism that "a sound mind can only live in a sound body."

Though perhaps Feuerbach goes too far in saying: "Der Mensch ist was er isst," and we should consider it rather an insult to man that "the way to his heart lies through his stomach;" yet a great truth underlies these exaggerated sayings, the truth that energy depends in the first place on health, one of its principal factors being good palatable food.

Among the many institutions of the kind in Holland the Amsterdam Cookery School (*Amsterdamsche Huishoudschool*) under the management of Miss S. G. F. Meyboom is one of the best.

We have much pleasure in quoting the following recipes which we owe to the kindness of this lady, whilst the photos which appear in our text were taken in the classes under her direction. One represents the object lesson in spices, whilst the other shows the practical application of the recipes we give below.

CULINARY USE OF BANDA NUTMEG AND MACE.

Brawn.—1 calf's head; 4¼ lb. veal; 1½ oz. salt and pepper; some gherkins; 1 grated nutmeg; 20 cloves, pounded; ⅙ pint vinegar; 1 leaf of gelatine to each ⅙ pint of liquid.

Boil head 5 hrs; meat 3 hrs. Remove bones and chop all. Mix with spices and some broth. Put mixture into mould, place paper with a slit cut in it, on the top; add vinegar and leave 8—10 days.

Meat-Chopped.—1 lb. chopped meat; 2 oz. soaked bread; ⅕ oz. salt; some pepper; ¼ nutmeg, 2½ oz. butter; 1 egg.

Soak bread in egg; work it into meat and spices; flour it and bake in oven with butter 30 mins.

Crême in clear Soup.—⅙ pint bovril; 2 eggs; nutmeg, pepper, salt; chopped parsley. Beat up eggs 10 mins; add the rest whilst stirring; leave 20—30 mins. in oven or bain marie till quite stiff. Cut it up into small squares and serve in clear soup.

Potato-purée in Scallop Shells.—1 lb. mashed potatoes; ⅙ pint milk; 2 or 3 yolks of eggs; 1 oz. butter; 5 oz. ham; some nutmeg.

Mix washed potatoes with spice, yolks, melted butter and chopped ham. Fill shells, flour them; small balls of butter on it; bake in oven, brown.

Mashed Potatoes.—1 lb. boiled potatoes; 1 pint milk; 1 oz. (not quite) flour; 2 oz. butter; some nutmeg.

Mix milk, butter and flour; slice potatoes into it; leave some time in oven and grate nutmeg over it.

Asparagus.—Clean them and cut off hard points; tie 6—8 together and boil in water or steam. Add melted butter, hard boiled eggs, and grated nutmeg.

Nutmeg may be grated over various vegetables: boiled lettuce; endives, French beans, cauliflower, savoy, white cabbage, turnips, purslain, etc.

Gelantine.—½ lb. veal; ½ lb. pork; 1½ oz. smoked ox-tongue; 1 oz. fresh bacon; ¼ grated nutmeg; 1 egg; ⅓ oz. salt and pepper; 1½ oz. soaked bread; 1 glass Madeira; 4 truffles; 3½ oz. tripe.

Cut up meat raw; mince with tongue and bacon; mix it with the rest, and make it into a ball; roll tight in tripe; tie cloth round it and boil 1¼ hr. Press 24 hrs. between two dishes under weight; serve with aspic and lemon, sliced.

Indian Cake.—3 oz. flour; 6 oz. butter; 6 oz. sugar; 5 eggs; 1 grated nutmeg; ½ stick vanille; 2 teaspoonfuls cinnamon; 25 cloves, pounded.

Whip butter into cream; add yolks of eggs, sugar, flour, spices and white of eggs beaten up stiff. Make thin layer in mould, previously rubbed with butter; allow layer to go brown; rub with butter; place second layer on it; etc.

Spice-Cake.—4½ oz. butter; 4½ oz. flour; 4½ oz. moist sugar; 4½ oz. currants: 4½ oz. raisins; 3 eggs; ½ nutmeg; 1 teaspoonful cloves, pounded; 1 teaspoonful cinnamon.

Mix butter and flour; stir yolk with sugar; add currants, raisins and spices; beat up white of eggs stiff. Then lay stiff white on yolks; mixed butter and flour on top; stir all gently.

Nutmeg-Cake.—9 oz. flour; 5½ oz. sugar; 7 oz. butter; 6 eggs; 1 nutmeg; 1 teaspoonful baking powder; ⅙ pint water.

Work butter into flour; stir yolks with sugar; add water and baking-powder. Beat up white of eggs stiff; stir it all gently; bake cake in mould, rubbed with butter, well floured and sugared.

Frankfort-tablets.—5 oz. flour; $2\frac{1}{2}$ oz. potato-flour; $3\frac{1}{2}$ oz. sugar; 3 oz. butter; 3 eggs; $\frac{1}{2}$ nutmeg, grated; 8 cloves, pounded.

Stir butter and sugar 10 mins.; and yolks, one by one; spices, stiff white of eggs add flour. Roll out paste thin on oven-tin; sprinkle some chopped lemon-peel and bake it light brown. Cut up in bars.

Tapioca-dish.—$1\frac{3}{4}$ pint milk; $4\frac{1}{2}$ oz. tapioca; 2 eggs; 2 oz. sugar; $1\frac{1}{2}$ oz. butter; some grated nutmeg.

Boil milk; add tapioca and stir well till done. Add sugar, butter and nutmeg. Let it cool down; add beaten yolks, and last of all white of eggs, beaten up stiff. Bake brown in baking-dish in oven.

Sausage-rolls.—4 (small) rolls; $3\frac{1}{2}$ oz. chopped beef; $4\frac{1}{2}$ oz. chopped pork; some chopped onions; 3 teaspoonfuls milk; pepper, salt, nutmeg to taste; chopped parsley.

Cut tops off rolls and hollow them out; rub inside with butter; fill with meat, dressed with other ingredients. Put on tops again, rub outside with butter; bake in oven till crisp.

Rissoles.—12 oz. meat, fish or shrimps; 2 oz. butter; 1 oz. flour; $\frac{1}{4}$ pint bovril; salt and nutmeg; 1 egg; chopped parsley.

Mix butter and flour well; add warm bovril; boil a few minutes; add egg, chopped meat and spices. Let mixture cool down; divide into balls or cones; roll well in flour; fry in hot fat till brown. Serve with sprigs of parsley, slightly fried.

Gelantine.—1 lb. scraps of meat; nutmeg and pepper to taste; 1 onion, chopped fine; parsley chopped; lemon juice; $\frac{1}{4}$ pint water; $\frac{1}{2}$ oz. gelatine.

Chop meat fine, mix with spices and put in mould; pour water over it in which gelatine has been dissolved; boil all $1\frac{1}{4}$ hr. in bain marie. Gelantine may be rolled in tripe and cloth, boil $1\frac{1}{2}$ hr. and press 24 hrs. between two dishes under weight. Serve with aspic.

Chopped Meat in Tripe (Old Dutch Recipe).—5 lb. beef; $2\frac{1}{2}$ lb. pork; 1 oz. salt; $2\frac{1}{2}$ nutmegs, grated; 35 cloves, pounded; $\frac{1}{8}$ oz. pepper. Wash meat and cut up into thin pieces; mince and season with spices; leave it one night. Soak pieces of tripe well in tepid water, clean well both sides and fill with meat, not too stiff. Sew them up and boil 2 hrs. well with salt; prick with fork from time to time. Hang them up 1 hr. and store in earthern pots with 3 parts vinegar and 1 part water. Skim off fat after cooling and keep this for frying.

Shut pots with damp vegetable-parchment covers.

To this list we may add the following summary of the qualities of the nutmeg:—

Banda Nutmeg is indispensable in a palatable and wholesome preparation of divers vegetables, cauliflower, spinach, onions, endive, turnips, etc.

Banda Nutmeg is indispensable in all sorts of minced and chopped meats.

Banda Nutmeg is indispensable in various piquant sauces.

Banda Nutmeg is indispensable in the yolk of eggs beaten up with brandy or cognac (egg-nog, a liqueur in great favour in Holland).

Banda Nutmeg and Mace are indispensable in all soups (the mace to be boiled quickly in a little cotton bag).

Banda Nutmeg is indispensable in several articles of pastry, as English "*plum pudding,*" Dutch "*Speculaas,*" etc.

Banda Nutmeg is indispensable in the egg-sauce with asparagus and in mashed and stewed potatoes.

Banda Nutmeg is an excellent ingredient in the kitchen, and may be appropriately used to season vegetables, made dishes and flour-puddings.

Banda Nutmeg is invaluable in seasoning every description of preserved meats, sausages and brawn.

Banda Nutmeg gives an additional relish to the dishes.

Banda Nutmeg-Tincture.—Grate three ounces of nutmeg, put the powder into a quart bottle and fill it up with good brandy or spirits of wine, cork it, and shake it well every day for a fortnight, then pour off the liquid, leaving the sediment behind. Put the tincture into small bottles, cork these closely and store for use. Probable cost, according to the quality of the spirit. Sufficient, three drops to flavour half a pint of liquid.

Nutmeg-skin Preserve and Truffles.—The fleshy outer skin of the fruit are generally left in the gardens, they may however be used to prepare an excellent home-made jam (*maniesan pala*). Stored in shallow pits they will also produce a fine edible truffle (*djamoer pala*).

MEDICINAL PROPERTIES OF NUTMEG AND MACE.

Besides the instance of the use of this nut for its medicinal qualities, mentioned in one of the first columns, showing that it was used in Persia about 906, Paulini quoted more than 138 cases of disease in which the *myristica fragrans Houtt.* may be applied, and there exists a voluminous literature on the subject. In the Moluccan Archipelago it has of old been used in case of dysentery, headaches and other nervous disorders. With the characteristic love of Eastern nations for stimulants, they were also the first to discover that it contained pronounced aphrodisiac qualities.

For skin and hair-ointment used as an embrocation in cases of cold, against sores and eruptions but especially against stomach-colics and hemorrhoids.

Even carrying nuts about one has been found beneficial in many cases and especially against rheumatism.

We quote the following recipes:—

Banda-Nutmeg. A spoonful of it grated with brandy and sugar is a pleasant, warming and inexpensive anodyne against sudden cramps and stomach-colics.

Banda Nutmeg, pounded fine and mixed with oil, fat or ointment is an excellent embrocation against rheumatic complaints.

Banda Nutmeg, used as a condiment in the preparation of vegetables, meats and other food, promotes the digestion, and acts as a preventive against spasms and other disagreeable sensations after a meal.

Banda Nutmeg acts gently stimulating on the organs secreting saliva, bile and gastric juices,

thus causing an increased secretion of these juices in the esophagus and greatly improving the digestion.

Banda Nutmeg has a most beneficial effect on the circulation of the blood, imperatively necessary for a good digestion, thus fitting the frame for a perfect absorption in the blood of the nutritious substances in the food.

Nutmeg-paste,—Inferior nuts damaged and broken are carefully excluded from export. Stamped, steamed and pressed on the estate, they produce a solid fat, which is cut in bars and sold as nutmeg paste, which makes a delicious ointment in the pharmacopœia.

AN ENGLISH STATION FOR BOTANICAL RESEARCH IN THE TROPICS (CEYLON).

The Royal Botanic Gardens of Ceylon, under the direction of Thwaites and Trimen, to go no further back, have long been known as one of the most important centres of scientific work in systematic and economic botany. Thanks to the British Association for the Advancement of Science, a small room next to the director's office was fitted up as a laboratory, in which have worked many botanists, chiefly English. Among those who have worked in Ceylon during the last decade may be mentioned Profs. Bower, Farmer, Goebel and Potter, and Messrs. Freeman, Keeble, Pearson, Parkin, and others. During the last two years the laboratory has been very much overcrowded, being used by the staff of the gardens as well as by visiting botanists. With the commencement this year of a new research laboratory, now being erected by the Department of Public Works, and to be completed probably before the end of the year, this difficulty will be overcome, and there will be ample room for several workers from abroad in addition to the members of the staff. This being so, it may not be amiss to give at this time an account of the facilities now available in Ceylon for research in the tropics. While the laboratory is primarily intended for botanical research, there is no intention of excluding workers in other lines so long as there is room for them, though of course money cannot be spent in providing special apparatus for their work.

The Royal Botanic Gardens form a department of the public service in Ceylon, under a director. The headquarters of the department are at Peradeniya, near Kandy, where the principal garden was established in 1821 by Moon. There are now smaller branch gardens in four other places in different climatic regions of the island. A brief account of these may be of interest.

The original Peradeniya garden lies within the Municipality of Kandy, about four miles from the centre of the town. It may be reached by driving in a carriage or rickshaw, or by trains which run at intervals to a station near the garden. The roads here, as almost everywhere in the island, are excellent for cycling. The garden has an area of about 150 acres, and lies in a very beautiful situation, in a loop of the Mahaweli river, and in very mountainous country. Its elevation above sea is about 1,550 feet, so that it has a much more pleasant climate than the low country. During the day the difference is but little, but the nights are very much colder than in Colombo, so that refreshing sleep can always be had; indeed, during most of the year a blanket is necessary. The mean annual temperature is 76° F., that of the hottest months (March and April) being 79°, that of the coldest (January and June) 74-75°. The highest shade temperatures ever reached are not excessive, rarely exceeding 90°, and in the present laboratory the highest in the last two years has been 82°, the lowest 65°. Work can thus be carried on with as little discomfort as in any European laboratory. The annual rainfall is about 90 inches, but owing to the great violence of tropical rain the number of rainy hours or days is very much less than in England. The number of days with rain averages 170 per annum, and it rarely rains more than four hours on any one day. Rain in the morning is also rare. The weather of the year depends on the monsoons. In the end of May the south-west monsoon begins to blow, and there is much wind and rain, the weather gradually becoming finer through the months of June and July. August and September and the first half of October are delightful months. In October the north-east monsoon begins, and until Christmas it is very wet. In January begins the "dry season," and during the next two or three months there is less rain than at any other time of year, and the weather becomes gradually very hot, though until April the nights are cold. March and April are the only really unpleasantly warm months in the year. The best time on the whole to visit Peradeniya is from October to March, but from July onwards is very nice, the objection to travelling at this time from Europe being the heat in the Red Sea, which, however, is much less formidable than is usually supposed in these days of swift boats and ice chambers.

The garden contains a splendid collection of tropical plants, and, being arranged like an English park, with wide spaces of lawn, the specimens are easily seen and photographed. In the centre lie the buildings of the museum, library, herbarium and laboratory, close together. The museum is chiefly devoted to the economic products of Ceylon, and contains a very good and interesting collection. The herbarium consists primarily of Ceylon plants; but there is also a general tropical herbarium, and a herbarium of the plants contained in the gardens. In the same building is the library, which contains about two thousand books and papers. There is an excellent collection of books relating to economic and systematic botany, and recently a large number of works on the other branches of botany have been added; a considerable number of journals is also received regularly, including such periodicals as the *Annals of Botany*, *Botanical Gazette*, *Botanische Zeitung*, *Flora*, &c.

The laboratory lies a few yards to the north of the herbarium. It consists of a one story bungalow of brick on a stone foundation, and with cement floor and tiled roof. The length of the building runs approximately east and west, and on the north and south sides there are no verandahs. At the east end is a verandah 8 feet wide, the ends of which are built up so as to form—one a lavatory, the other a dark room for photographic work, fitted with sink, &c. At the west end is also a verandah of the same size, not built up in any way.

The building has six entrances, provided with French windows, two at each end and two on the south side. The other windows stand above the ground, and open outwards. There are doors leading from each room into all the adjacent rooms, so that free ventilation can be obtained, and at the same time any room can be completely shut up if required to prevent draughts without interference with the accessiblity of the others.

The principal room, the general microscopic and morphological laboratory, lies to the north-west, and is 36 feet long 18 feet wide. It has four working windows facing north, each with table, shelves, sink, &c., and two other windows facing into the west verandah, which can also be used as microscoping windows if required. The central part of the room will contain larger tables for microtome and other apparatus, and writing table.

To the east of this room is the smaller room devoted to physiological and pharmacological investigations. Leading out of this room is a French window, which gives access to the little eastern verandah, which may be used for cultivation experiments, &c. This room has two good working windows facing north, besides the French window. It is provided with three sinks and an annual temperature of 61° F. Frost never occurs, though it is

frequent at slightly higher elevations, such as Nuwara Eliya (6,200 feet). There is, unfortunately, no accommodation for visitors at present nearer than Nuwara Eliya, six miles away; but it is hoped to erect a small laboratory in the garden, with a small living room attached, where workers may live and sleep.

A fourth garden is kept up at Badulla, the capital of the Uva province, at an elevation of 2,200 feet, on the eastern side of the mountains The chief botanical interest of this district lies in its somewhat drier climate, so that it has much more patana land than the western side of the mountains, and in the fact that its dry season comes, not in the north-east but in the south-west monsoon, so that the periodicity of the vegetation is different. Fruit, which at Peradeniya ripens in March and April, ripens at Badulla in August, and so on.

Yet another garden is maintained at the ancient capital of the island, the famous "buried city" of Anuradhapura, the capital of the North-Central province. This lies in the middle of the dry country, which makes up about three-fifths of the island, and has an Indian climate, with rain almost confined to the last three months of the year, and drought during the remainder, including the south-west monsoon. The flora of this district is therefore, as might be expected, very different from that of the rainy south-western and central provinces.

The island can show, within an area of rather less than that of Ireland, a most remarkable range of climate and flora, rendering it very interesting to the traveller and naturalist; in this respect it is unrivalled in the tropics. The working botanist or student has, further, the great advantage of having at his hand the excellent flora prepared by Dr. Trimen, and finished after his death by Sir Joseph Hooker. There are doubtless many new species still to be found in the eastern and south-western districts, as well as many unrecorded species; but the student who does not desire to specialise in this department of botany will be grateful for the useful flora, which renders the identification of his collections, or of the plants he may be experimenting with, a matter of comparative ease. The vascular cryptogams and many of the mosses have been identified, but there is much to be done at the lower forms of vegetation.

Peradeniya is easily reached from any part of the world, Colombo being one of the greatest ports of call. Direct lines of steamers run to Europe, China, Japan, Java, Queensland, Adelaide, Melbourne and Sydney, Mauritius, South Africa, and all Indian ports. Madras may be reached in thirty-eight hours by boat and rail. To England there is a very large choice of steamers. The favourite lines with Ceylon people are perhaps the Bibby and the Norddeutscher Lloyd, but the P. and O., the Orient, Messageries Maritimes, British India, and many others, are much used. The first-named is the cheapest of the large English lines, but is first-class only. First-class returns to Colombo, available for six months, are from 70*l*. to 90*l*. Second-class, which is very comfortable on the largest lines, is from 50*l*. to 60*l*. A few pounds are necessary on the voyage for tips, sports, trips on shore, &c. Banking accounts may be opened in Kandy, and money easily remitted to and from Europe. The value of the rupee is now 1*s*. 4*d*., and seems likely to remain at that figure.

Very little is necessary in the way of outfit. Drill and khaki clothes can be bought here for less than half their price in England; also topees (sun hats). At Kandy the usual dress is similar to that worn in England in summer; at Nuwara Eliya it is colder, and tweed suits are often worn. All articles of clothing can be bought here, and usually as cheaply as, or more so than, in Europe.

The usual division of the day is as follows: Rising at daylight, a light early tea of eggs and toast is taken about 6-15, after which a walk in the garden is pleasant, commencing laboratory work at 7-30, and continuing till 11, which is the breakfast hour. After breakfast follows a rest indoors, but not sleep, and work may be resumed at about 1-30 for a couple of hours or so. After tea the remaining two hours of light are given to tennis, cycling, and other forms of exercise, followed by a bath, and dinner at 7 or 7-30. The evening is devoted to amusement.

Travelling in Ceylon is easy in all but the most out-of the way or sparsely populated parts. Railways and good roads intersect the greater part of the island, and there are coach services to a great number of places not served by the railways. Rest-houses or Government inns are found in all towns that have no hotels, and at intervals of 14 miles along all main roads. The average cost of living while on tour may be put down as about R7 or 8 per diem exclusive of fares by rail or coach. Steamers run round the island, calling at all the chief ports.

There is at present no rest-house or hotel at Peradeniya itself, and visitors must live in Kandy, where arrangements have been made with some of the hotels to board persons working in the laboratory at from R5 to R7 per day. There is a convenient service of trains, but the most satisfactory way is to cycle in and out. The road is in excellent order, and the distance from the furthest hotel under five miles. It is hoped that accommodation may be provided at Peradeniya itself before long.

Assuming that six months are spent from starting to date of arrival back in Europe, the cost of the trip should not much exceed 185*l*., made up thus:

Fare (First return)	..	£85
Twenty weeks' board	..	66
Travelling ..	..	20
Sundry ..	..	12 to 20
		£191

This might be much reduced by economy, and by travelling second-class from Europe, and the proportionate cost would of course be less if the visit were of longer duration. If much travelling is to be done in the island the amount shown above will have to be increased, the 20*l*. being allowed for four weeks only. By very close economy and reduction of travelling, and by travelling second-class, the total might be reduced to perhaps 140*l*.

Trustworthy information about Ceylon may be obtained in various books. The most interesting are Sir E. Tennent's "Ceylon," which is now out of print; and to a botanist, Trimen's paper "On the Flora of Ceylon as affected by Climate," in the *Journal of Botany* for 1886. Ferguson's Handbook and Directory contains a vast mass of information and statistics, and his "Ceylon in 1893" is also of interest.

Intending visitors should communicate some time in advance with the Director, mentioning what line of work they propose to take up, and any special facilities they may require. JOHN C. WILLIS.

—*Nature*.

SUGAR IN TIRHUT.—A correspondent of the *Englishman* writes:—I hear from several sources that on account of the disturbed state of the indigo market many men are talking of starting sugar, and that several men have commenced growing cane with the idea of testing the produce of crude sugar likely to be got per acre of cane. . . . . My advice to such is to have nothing to do with growing cane themselves. Let the ryots do this and make crude stuff called goor and *raub*. This planters could buy from the ryots and refine. There are at all indigo factories engines used for indigo work which will be quite powerful enough to drive the turbines now used in the manufacture of sugar. When sugar was an industry in these districts in the early forties what brought it to grief was that factories grew their own cane, and sugar-cane, it was found, exhausted the soil, and though the cane grew the yield fell from over 40 maunds of sugar per acre to less than 2½.—*Pioneer*.

THE TRADE OF CEYLON IN 1899.

(By a Merchant.)

(Continued from page 499.)

No. II.—IMPORTS.

Exchange has been steady throughout the year and this has contributed to foster regular shipments of Imports to Ceylon. Prices although steady during the earlier part of the year have been against importers during the later stages. The year closes with bills being discounted locally at eight per cent, as against seven per cent at the close of 1898.

Money in India has been easy during the greater part of the year, but a tightness is now beginning to be felt and we shall probably have higher rates of discount quoted in the near future.

Cotton Goods.—Since the beginning of the year raw cotton has steadily increased in value, the present prices being fully 45 per cent higher than those ruling at the end of 1898. There is a diversily of opinion with regard to the American Cotton Crop as to whether it will exceed or fall short of 10,000,000 bales and this is not without its influence on the market.

There has been a great falling-off in the importation of grey cotton goods; whilst on the other hand prints and coloured goods shew a considerable increase. The quantity of white goods imported is about the same as in 1898. The prices of cotton goods in Europe have advanced since the 1st January, 1898:—

Grey Shirtings	..	18 per cent
Do Drills, America	..	26 do
White Shirtings	...	15 do

Prices locally, although on the upward grade, have not yet risen to the same extent as in Europe, but it is obvious that much higher rates will be quoted later on, when stocks are depleted, unless a great reaction sets in, in Europe.

Many manufacturers are well engaged, some having their looms filled for the next six months.

The following figures shew the importation for the first 10 months of 1899 and 1898:—

		1899.	1898.
Grey cottons, bales and cases		2,375	4,341
White do	do	2,032	2,058
Printed do	do	996	626
Dyed do	do	91	89
Coloured Woven	do	8,775	6,945
Sundry ...	...	65	90
Yarns, Plain ...	...	1	11
Do Dyed ...	..	164	178
		14,499	14,338

Woollen Goods.—During the past nine months the value of raw wool in Europe has advanced over 50 per cent. Manufacturers are consequently asking much higher prices for made-up cloth, and we are sure to see higher rates quoted locally ere long.

Metals.—A good business has been done in iron and other metals. Prices after remaining steady for the first three months of the year, suddenly took an upward tendency, and the difference between prices in Europe at the beginning of the year and now are:—

Scotch Iron	37	per cent higher
Belgian	50	do
Swedish Iron	33	do
Galvanised Iron Sheets	31	do
Hoop Iron	38	do
Tin Plates	40	do
Copper	25	do
Nails	25	do
Tea Lead	25	do

All other articles of which metal constitutes a part, have risen very considerably in value. The present situation in the iron markets of the world is, we believe, without parallel in the history of the industry. In every manufacturing country of importance the demand for pig iron has not only outrun the supply, but has so far outrun it as to make it unlikely that any country will be able to produce a surplus for export, after satisfying its own demands, for fully a year to come. The outlook then is decidedly in the direction of a continuance of the present strong demand for iron and steel, and consequently, of the presnt prices.

Matches have advanced some 12 per cent in value.

Window Glass has advanced some 18 per cent in value.

Cement—a fair quantity has been imported. Prices have been firm, but have not advanced much.

Spirits.—The following figures shew the importation of spirits, &c., for the first 10 months of the years 1898 and 1899, and it will be seen from these figures that the quantities of gin and whisky entered for consumption in 1899 shew a decided increase over those of 1898; brandy on the other hand shews a decrease:—

Bonded		in 1898.	in 1899.
Malt Liquor, in wood, hhds.		1,367	1,615
Do glass, cases & casks		538	545
Brandy cases	..	3,336	1,875
Gin do	..	2,676	6,623
Whisky do	...	6,168	5,167
Entered for consumption		**in 1898.**	**in 1899.**
Malt Liquor, in wood, hhds.		1,506	1,692
Do glass, cases		565	155
Brandy cases	...	2,260	1,657
Gin do	...	2,439	5,471
Whisky do	...	4,683	5,131

Rice.—The crops in Bengal are turning out well and Soolai Rice can be purchased locally at R3·10 to R3·20, against R3·55 ruling 12 months ago. Owing to the drought in Southern and Western India Calunda rice is rising in value.

Coals.—The importation of Indian coal is still increasing; this coal being used largely by the Railway Locomotive Department and a number of Steamship Companies. Cardiff coal continues to be brought in smaller volume each year.

THE NILGIRI RAILWAY AND LEASES OF COFFEE TREES.

On representations made by owners of coffee estates along the Nilgiri Railway, asking for a reconsideration of the Board of Revenue's refusal to permit the leasing of coffee trees on lands acquired for the Railway, the Madras Government has passed the following order:—His Excellency the Governor in Council is pleased to

direct that the coffee trees on lands taken up for the Nilgiri Railway may be leased [to the adjoining landholders, subject to the following conditions :—(1) That the lease shall be for the season only ; (2) that Government reserves the right of entering on such land at any time and without notice ; (3) that if the Railway authorities have occasion to cut the trees during the period of such lease a proportionate amount of the rent shall be refunded.—*Madras Mail.*

THE HATFIELD CURE FOR RED SPIDER.

Relative to the note on the above subject, which was published on the 16th instant, and the footnote appended, on the utility of sulphur as an effective antidote for this insidious pest, the following quotation from E G Lodeman's (instructor on Horticulture in the Cornell University) book on *The Spraying of Plants* may have a fitness, along with the practical experience of Mr. Norman. "Sulphur is valuable both as an insecticide and as a fungicide. Its use for the first purpose is practically confined to greenhouses and conservatories, and even there only few insects are affected by it. It is most rapidly applied by evaporating in a sand bath over an oil stove, but extreme care must be given that it does not take fire, as then it will instantly destroy all the plants. Red spider and related insects are said to be destroyed by the fumes, and treatment should be made as soon as they are discovered, or even before. Sulphur may also be evaporated successfully by placing it upon the heating pipes ; it is well to mix it with an equal amount of lime, and then add water to form a thick paint, with which the pipes may be covered. When applied in a dry form directly to the plants, it possesses little value as an insecticide. A moist atmosphere in the house probably renders the fumes more effective (this latter suggestion should form a valuable adjunct to the sulphur treatment, as observation tends to show that a dry atmosphere is favourable to its development ; whilst the converse, namely, moisture is a deterrent, and spraying with water has always been advocated as a specific)." Sulphur is one of the most valuable fungicides for the treatment of surface mildews, and it has long been used for this purpose. Previous to 1880, it was almost the only fungicide used in Europe, and it did excellent service in coutrolling the European mildews which attacked the Vine and many other plants whether grown under glass or in the open. Out of doors it was commonly applied in a dry condition being blown upon the plants by means of hand bellows. Under glass it was used in three ways ; in the form of powder, when mixed with water, and when evaporated from the heating surfaces. The first method was executed in the same manner as out doors. When mixed with water both the sulphur and the water assist in destroying many pests, and it is a common practice to make such applications. The proportion of the two varies greatly. It has been recommended to use 1 ounce of sulphur to 5 gallons of water, and also as much as 1 pound to 1 gallon. The more dilute mixtures are more easily applied and if the work is thoroughly done, are on the whole, equally valuable. The fumes of sulphur for treating mildews are obtained as described above. When the powder is used out-of-doors, the value of the remedy undoubtedly rests in the fact that the sulphur gradually gives off fumes on account of the heat of the sun, and the mildews yield for the same reason that they do when the powder is evaporated under glass. One of the most valuable preparations of sulphur is known as "Grison's Liquid." Although this latter insecticide is fairly old, to give the formula may be of service to some growers. Take the following :

Flowers-of-sulphur	500 grams or 17 oz	(avoird.)
Freshly-slacked lime	500 grams or 17 oz	do
Water ,,	3 litres or $5\frac{1}{4}$ pints.	

Boil the above ingredients for ten minutes, let the mixture then settle, and draw off the clear liquid after which the liquid must be bottled to use, 100 parts of water to 1 part of liquid, and apply with a syringe (still lately the quantities of sulphur and lime have been reduced respectively to one-half). This prescription was always advocated as an excellent cure for surface mildews, and about three applications were sufficient to preserve the foliage. It seems feasible to suggest that instead of syringing, heating the inteuding wash might prove more effectual in the houses. *J. O'Neill.—Gardener's Chronicle.*

PRODUCE AND PLANTING.

CHINA TEA IN 1899.—In its review of the past year's tea trade, the *Grocer* says of China tea, "This branch of the trade has now become almost a negligeable quantity. Of late years it has only been used by the trade to reduce the cost of the low-priced blends when Indian and Ceylon leaf was high, while a certain amount of good and fine Moning will always be used by people of weak digestion or connoisseurs who drink tea as they would a glass of fine wine. Of late years the bulk of the better teas have been re-exported to Russia and the Continent when their stocks have run short, but unluckily exporters have not come to our aid the whole of this year, partly because they have imported more direct, and also on account of their using more Ceylon tea, hence the disastrous losses made between January and June on the remainder of last season's fine teas that were left.

CEYLON TEA.—Ceylon tea has been rather disappointing, more especially for the first half of the year, when Indian tea was carrying everything before it, and supplies from Ceylon were falling off in comparison with the previous year. However, it is a noteworthy fact that deliveries always improve and keep pace with each monthly increase. For the first six months of the year supplies and deliveries both showed a decrease of three million lb. Since then imports have been heavy, or, say, an increase of four million lb. for the last half of the year, thus making the total imports for the year 97 million lb., against $94\frac{1}{3}$ million lb. in 1898. Deliveries have increased at the same rate for the last half of this year, the decrease for the first half being not only wiped out, but leaving a small balance in favour for 1899, or nearly 94 million lb., against $93\frac{1}{2}$ million lb. in 1898. Stock, however, has increased, and we shall commence the new year with 20 million lb. against 17 million lb. We notice by the Board of Trade returns that the re-exports of Indian and Ceylon teas show only a very small increase for the year, whereas last year they added largely to our increased total deliveries. The reason, however, is not far to seek, as the Continent and Russia are taking so much more direct, and we are fast losing these valuable outlets for our increasing supplies. The year opened with low prices, viz., $5\frac{1}{4}$d to $5\frac{1}{2}$d for leaf, but as Indian tea improved, Ceylon leaf was carried with it, and prices rose rapidly until Easter, when good leaf teas were bringing 8d per lb, and rough, ugly, red leaf kinds about $7\frac{1}{2}$d per lb, with dusts in proportion. Better teas, however, showed only small improvements, and ordinary Broken Pekoes have offered capital value all through the year. Finest liquoring and tippy Brokens and Pekoes suitable for exports have been scarce, and have always commanded long prices, especially in the spring and autumn, when quality is at its best. For instance, there is often a difference of 6d per lb in the same well-known garden Broken Orange Pekoes, according to the time of year, when quality is good or poor. Fair ordinary to good Broken Pekoes, however, do not vary much in price all through the year, and are relatively cheaper than any other class, owing to their oversupply and limited demand, as export only takes leaf teas. After Easter leaf teas took a downward turn, and followed the trend of the Indian market, while the quality offering in medium grades in May was particularly good, with capital value

to buyers. In July and August, when quality was poor, the quotation ran down from 6¼d to 5½d, with a very weak market; but quality and prices in September began to improve. Rates for fine teas were extreme, and Broken Orange Pekoes realised 1s 3d to 1s 8d for the favourite garden marks. A good business, with improving prices, ruled up to November. Then quality fell off, and up to the end of the year there were small ups and downs in leaf teas for price, with steady trade and good deliveries. By Ceylon circulars we find that the year's crop shows an increase of over 7 million lb. America and Russia each take 1 million more, and Australia ½ million more, the surplus balance being shipped to the United Kingdom, but probably nearly a million will go overside for transhipment. The last sale of the year closes with a very strong tone for price tea, the quotation being 6½d, against 5½d last year for either Pekoe Souchong or Pekoes. Good liquoring Pekoes and Orange Pekoes, however, are, if anything, rather lower than last year, say at 7d to 8d, and Broken Pekoes look about on a par. Dusts and fannings are a good 1d. dearer, thus showing what a run there is on "price" tea.

COFFEE IN 1899.—The total receipts of coffee in the United Kingdon during the first eleven months of the year now closed were 974,070 cwt. in comparison with 900,850 cwt in 1898 and 720,600 cwt in 1897, and the only instances where a decrease occurred were furnished by Brazil and Central America. Although very little Brazil coffee reaches this country, most of it going to other European ports and the Uuited States, it none the less exercises the greatest influence on the world's markets, when the crops in Rio and Santos come to be considered; and the strongest movements, which are speculative, are regulated entirely by what happens in connection with the production of coffee in the Brazils. This, in 1898, proved to be the largest on record, embracing 11,332,000 bags. as contrasted with 8,942,000 bags in 1897 and 5,969,000 bags in 1896. The effect of this enormously big crop has been to overwhelm the coffee market everywhere, and almost throughout 1899 a downward tendency has existed.

MOCHA COFFEE.—In a recent report the American Consul at Aden discusses a statement which is frequently made, and which has been repeated quite recently, that no genuine Mocha coffee reaches the European or American markets from the Arabian ports. The Consul says this statement is quite erroneous, for the books of his own Consulate at Aden and of the Consular Agency at Hodeida show that over 5,000,000lb of Mocha coffee were invoiced from these places to the United States last year not to speak of the quantity sent to Europe. But it is said that though nominally shipped from Arabian ports, it is really coffee grown elsewhere, and then shipped to Aden to be reshipped as Mocha. This suggestion is also erroneous, as appears from a letter from the British authorities at Aden on the subject. It is true that parcels of coffee from Java, Singapore, and other places landed in Aden, but according to the official communication above mentioned, these parcels are bonded in the warehouses of the owners at Maalla, and the key lodged in the trade registration department. "When the owner desires to export, a peon of the department is sent with the key to count the bags and bring them to the wharf. As the merchant or owner can have no access to his goods unless accompanied by the peon of the department, the transfer of the inferior bean to Aden for mixing with that of Mocha or Harrar is hardly possible." The Consul adds that an examination of the Customs authorities' reports show that foreign coffees are promptly re-exported to other ports, being landed at Aden for transhipment only; while the precautions in Turkish Arabia to prevent mixing are equally stringent. No doubt Mocha coffee is mixed with inferior beans in Europe and sold as genuine Mocha, but it is hardly possible that an importer buying in an Arabian port could get anything but genuine Mocha or Harrar coffee.—*H. & C. Mail*, Jan. 5.

CEYLON PLANTERS' ASSOCIATION.

ESTIMATE OF TEA CROP 1900.

At the last meeting of the Planters' Association Committee, a large amount of business was got through, but it is not necessary here to do more than indicate the main points. The tea crop for the current year is estimated at 138,000,000 lb. of which 108 millions will go to the United Kingdom and the rest to Russia, Australia, America and other countries. A suggestion was made by the Chamber of Commerce that the grant to America should be reduced and greater attention paid to the continent, but the allocation having been already made and intimated to our Commissioner no action can be taken in this direction at present. We thoroughly agree with the Chamber that there is very large scope for our energies on the continent and we are confident that much good will remit from the labours of Mr. Renton there as well as from the Paris Exhibition where Government is to incur expenditure amounting to £3,477 on account of the tea industry. We hope Government will see its way to adopt the suggestion as to adorning the first-class railway carriages with photographs depicting the tea industry. As was to be expected a hearty vote of thanks was passed to H.E. the Governor for securing the appointment of a mycologist, and we hope that when they next meet they may have the pleasure of passing a similar compliment upon the appointment of Mr. Kelway Bamber as agricultural chemist for the Colony. Mr. Wilkinson—has been in communication with the Committee on the subject of Labour Supply and he has been informed that there is work available on estates for no fewer than 50,000 coolies. The present is considered a favourable time for recruiting from the Coast and we have no doubt employers of labour will make a note of the fact and act upon the hint. The Committee are prepared to substantiate the allegations which have been made regarding short delivery of goods on the railway. If the General Manager meets them in conference as requested, a better understanding may be arrived at and steps taken to avoid future annoyance in this respect. Other subjects considered were fire insurance rates, the prevention of cattle disease, the inadequacy of the batta allowed to witnesses attending the Supreme Court Sessions (to consider which a sub-Committee has been appointed); a proposal by Mr. Borrett (deferred at present) that an ordinance should be drafted for the purpose of checking abuses that at present prevail in connection with promissory notes; the duties and powers of hospital visitors; and the opening of the Victoria Commemoration Buildings which His Excellency the Governor has been asked to perform on the 17th February. The objects of the Society for the Prevention of Cruelty to Animals have been approved, and the Ceylon Nurses'

Association commended to the support of the Planting Community and Europeans generally. The establishing of Rural Police in the Northern districts seems to have been attended with good results, the experience of the honorary secretary being that thefts of cocoa in the field had stopped since then.

TEA MOVEMENTS FOR THE WHOLE YEAR.

IMPORTS.

	1899. lb.	1898. lb.
Indian ..	140,646,100	138,874,490
Ceylon ..	96,188,170	94,319,832
	236,834,270	233,194,322
Indian Increase		1,771,610
Ceylon do		1,868,338
Total Increase		3,639,948

DELIVERIES.

	1899.	1898.
Indian ...	140,481,161	139,089,130
Ceylon ..	94,225,004	93,488,012
	234,706,165	232,577,142
Indian Increase		292,031
Ceylon do		736,992
Total Increase		1,129,023

			lb.
In 1893 Imports	exceeded	Deliveries by	6,187,414
1894 Deliveries	do	Imports by	3,389,982
1895 Imports	do	Deliveries by	4,809,479
1896 Imports	do	Deliveries by	5,302,280
1897 Imports	do	Deliveries by	5,803,183
1898 Imports	do	Deliveries by	617,180
1899 Imports	do	Deliveries by	2,128,105

LYALL ANDERSON & Co., 16, Philpot Lane, London, E.C., 2nd January, 1900.

ISSUED BY THE TEA BROKERS' ASSOCIATION OF LONDON.

3rd January, 1900.

Stock on 31st December, 1897, 1898, and 1899.

Stock.	1897.	1898.	1899.
China Tea ...	19,056,000	17,325,000	18,980,000
Japan ...	110,000	104,000	156,000
Java ...	598,000	535,000	482,000
	19,764,000	17,964,000	19,618,000
Indian Tea ...	61,673,000	61,319,000	61,484,000
Ceylon Tea ...	16,629,000	17,224,000	19,187,000
African Tea ...	30,000	55,000	21,000
Total ...	98,096,000	96,562,000	100,310,000
Black lb. ...	95,095,000	92,921,000	97,704,000
Green " ...	3,001,000	3,641,000	2,606,000

SUGAR-PLANTING IN PENANG, ON ZAMBESI AND IN CEYLON.

We have had a couple of very interesting interviews lately. First, our friend Mr. Turner, of Penang (who, with Mrs. Turner and family, arrived by the "Oceana" on the 23rd ult. to give a fortnight in Ceylon) is here, as promised, to enquire about land suitable for sugar in the Northern or Eastern divisions of the island. We have been collecting information for Mr. Turner who was likely to visit Anuradhapura last week his further movements being determined by what he may see and learn.—Then the "Clan Sinclair" to Galle brought from Beira, East Africa, Mr. Hornung, of Zambesi, and two Rhodesian friends, unable to get away *via* Delagoa Bay: they had to travel northwards to Beira and take this Clan boat. Mr. Hornung has a Sugar Estate on the Zambesi, but is interested in Rubber and other products, and has had our *Tropical Agriculturist* for the past 12 years. He went home by the Orient steamer last week: and visited Heneratgoda and Peradeniya in the interval.

CEYLON PRODUCE IN LONDON.

(From *Wilson, Smithett & Co.'s Circular*, January 5th.)

COCOA.—The market has remained closed as regards auctions since December 19th, and although a firm tone bas existed throughout the interval, the volume of business on the spot is small cosequent on the paucity of supplies, while forward business is limited by advancing quotations, although some transactions were effected at higher rates. The arrivals of new crop Ceylon are increasing and this growth is likely to form an important item at the opening sales on Tuesday next, but in the meantime business is confined to 200 bags, low at 61s to 62s, fair to good at 70s to 80s per cwt.

CINCHONA BARK.—The first auctions of the year in London are fixed for January 16th. Tbose in Holland for the 11th instant, when a total of 7,540 packages is advertised. This total compares with 7,087 packages analysing 5·14 per cent at the last sales, and 8,090 packages averaging 5·29 per cent. at the first series of 1899. The shipments from Java in December are telegraphed as only 626,000 lb. (Dutch), being as much as 400,000 lb. below last year: the total for the year, given below, is only a quarter of a million pounds over 1898. During the past year the fluctuations in the market valne have been very wide, the net result at the close of tbe year being to leave prices higber by 50 per cent than at tbe commencement. The year opened at the first sales with the unit value 1d, but on the shipments from Java in January and February shewing an important falling off, prices rapidly advanced, culminating at the end of March in a unit of 2¼d, which was the highest price touched during the year; from this date onwards, under the influence of tbe larger shipments from Java, which the rise in value induced planters to make, the market gradually reacted until at the October sale the unit had fallen again to 1 1-16d to 1⅛d. In the remaining two months of the year, stimulated by an active world's demand for the manufactured producet and by the fact that notwithstanding the great pecuniary inducements held out to Java planters during the year, their shipments had only exceeded the previous year's by a little more than half a million pounds, tending to confirm tbe view held in many quarters that the normal harvest was being somewhat inflated, prices again rapidly advanced until 1½d the unit was paid at tbe December sales. Tbe market is thus shown to be exceedingly sensitive, any slight curtailment of supplies having at once an apparently abnormal effect; sbould the supplies in tbe current year be no larger than in 1899, a further enhancement in values may be expected, and stocks in London and Amsterdam

be further depleted. Now, as for several years past, the future rests with the Java planters, British possessions being unable to furnish any important quantity. At an established unit of 2d and upwards, a certain quantity of cultivated Calisaya could be imported, but it would require 3d the unit to encourage any shipments from the old districts in South America, whence the market was originally supplied.

The following are the Java shipments for December, with the totals for the past four years; the shortness of the shipments last month, and the fact that the total for the year has only exceeded the previous year by 250,000 lb. has created a great impression and strengthened the belief that the maximum output from that island has been seen:—

Java Shipments, December.

	1899.	1898	1897.	1896.
	pounds.	pounds.	pounds.	pounds.
Amsterdam	626,000	1,018,000	731,000	890,000
Java Shipments, January-December.				
Amsterdam	11,390,800	11,133,000	8,511,000	10,079,000

From the table below of the movements in London during the past year, it will be seen that the Stocks in this port have been decreased by 4,000 packages, and are now at the lowest point touched during modern memory; the deliveries during the year have been exceptionally heavy, while the imports are considerably below 1898.

Stock in London on December 31st.

	1899.	1898.	1897.	1896.
	Pkgs.	Pkgs.	Pkgs.	Pkgs.
East Indian	6,620	7,440	4,450	8,310
South American	9,480	12,550	12,240	1,380
Imported in the year.				
East Indian	14,830	20,600	10,180	16,920
South American	4,580	5,470	3,410	2,770
Delivered in the year.				
East Indian	15,670	17,640	14,040	18,050
South American	7,630	4,930	5,050	6,190

SULPHATE OF QUININE.—The market has developed strength since the bark shipments for December became known, and a further advance of ½d to ¾d per oz. has taken place, spot having sold up to 1s 3½d, March up to 1s 4d, and May up to 1s 4½d per oz. Following the fluctuations of the bark market this article has experienced during the past year some sensational movements, the value rising and falling in a manner which has not been seen for many years. The volume of business has been enormus, and largely in excess of any previous year, due in great part to the attention which it has attracted as a medium for speculation. Like the raw material the price at the commencement of this year is about 50 per cent higher than at the same time last year, and unless speculation again carries the value highr than the parity in bark, its future movements must be governed by the fluctuations in that article. Commencing the year with a spot value for "second-hand" German of 10½d, the price was rapidly driven up to 1s 9d at the end of March, future months being proportionately dearer, 1s 10¼d being about that time paid for October delivery; with many fluctuations the value gradually fell from this point, until the lowest point was touched at the beginning of October, viz., 10¼d. A brisk rise then followed, under the initiative of manufacturers, who raised their price successively from 11½d to 1s 3½d, and the year closed with a value for "spot" in second-hands of 1s 2¾d per oz.

A feature in the history of this article will be the commencement in Febrary of periodical public auctions in Java of Quinine manufactured in the factories there.

The landings during December exceeded the deliveries by nearly 160,000 oz., a good deal of new manufacture being imported from the factories, against an increase in December, 1898, of 70,000 oz. The stocks in London are now returned as 2,793,056 oz., against 1,795,984 oz., 1,539,264 oz., 1,407,264 oz. and 1,972,432 oz. in the four preceding years. The excess in the stock is thus one million ounces, ro equal to one month's estimated world's consumption.

The total imports into London last year were 1,973,000 oz., against 1,032,372 in 1898, 640,000 oz. in 1897, and 233,000 oz. in 1896 while the total deliveries were 976,050 oz., against 775,660 oz., 508000 oz., and 798,000 oz. in the three previous years.

PLANTING NOTES.

THE AGRICULTURAL COMMISSION'S recommendations have, to a considerable extent, already been dealt with by the Governor. The Scientific Staff, for instance, is now well-filled, the last requirement being secured by Mr. Carruthers' appointment as Deputy-Director and Mycologist; and we learn that a Departmental Committee—of the Director of Public Instruction, Conservator of Forests, Director of Botanic Gardens and Government Agent—is now looking into the feasibility of the proposed transfer of the Agricultural School to the neighbourhood of Kandy. There remains the question of appointing a Director of Agriculture or an Agricultural Board, and we believe the latter is the more likely Executive decision as the outcome of the Commission's labours.

VISITORS FROM MADAGASCAR.—Dr. Lacaze, from Madagascar, had an interview lately with His Excellency the Governor. The object of the present visit to the East of himself and colleagues—one being an administrative, and the other an agricultural officer—is to collect information in Ceylon, the Straits and Java that may be of service in the administration and development of the big island-colony now entirely under French rule. Dr. Lecaze and Messrs. Guyon and Prudhomme have been securing a large number of our island and planting publications; and they mean to visit different parts of the island, more especially the Botanic Gardens and certain select plantations of the different staple products, before going on to Java. We bespeak all possible attention to our French visitors who will be found exceptionally intelligent with a fair command of our language and who are anxious to profit by local experience.

CEYLON TEA IN AMERICA.—We are indebted to Mr. W. Mackenzie for copies of several newspapers showing what the Americans are doing in the way of pushing the allies of Ceylon tea. The Toronto *Globe* devotes almost an entire page with illustrations to a description of the work done by, and the premises of, the Blue Ribbon Tea Company which was formed in 1896 for the purpose of putting up, in the now well-known package form, the produce of the finest tea gardens in Ceylon; and "The Weekly Common-wealth" published in Covington, N.Y., has a column principally eulogising Lipton's teas; while in others "Salada" tea is prominently advertised in English and French, a good word being put in for Ceylon greens. In one of the illustrations, typical representatives of Ceylon and Japan are shown lying prostrate: the verdict of the medical man, who has his finger on the pulse of Japan, being "beyond human help." Ceylon tea is held aloft by a figure of victory and there is the inscription: "Barbarous methods disappear before civilization."

Cacao in Trinidad.—There is a curious statement in the letter of Mr. Hamel-Smith dealing with Cacao (see elsewhere). It is stated that the members of the Legislative Council of Trinidad "refused to sanction" this year's estimate of the crop, on the ground that the deficiency will be 30 (and not 25) per cent as estimated by experts! Trinidad has had a dreadful drought.

Tea in Travancore.—The Travancore correspondent of the *Madras Mail* writes:—"A whisper reaches me that the tea planting on the Higher Ranges is not likely to be quite the success that was at first expected it would be. But I shall make further enquiries. There are all kinds of difficulties, the greatest of which are a want of sufficient rain during certain months and too much frost during others, thus minimising seasonable and profitable flushes."

India-Rubber Trees.—Large tracts of forest with abundance of rubber trees are said to exist in the unexplored interior of the State of Bahia (Brazil); but, unfortunately, owing to the difficulties of transport through a country without roads, and to the fact that the forests are inhabited by different tribes of Indians, some of whom are cannibals, it is said to be unavailable. The quantity of rubber produced in the State during 1898, however, increased materially, the high prices realised inducing collectors to proceed further a field for supplies.—*British and Colonial Druggist.*

Indigo: A Threatened Industry and Sugar as a Substitute.—A long communication to the London *Times* of Dec. 26th on Indigo, winds up as follows:—

Such careful selection of land as has been indicated will of necessity leave at the factories a larger area available for the cultivation of other crops. If we were to assume even that indigo-growing were absolutely killed by chemical discoveries and were to cease to exist at some future date, then, obviously, those now engaged in that industry would be called upon to grow other crops on their land, and would be obliged to find out what crops would pay them best. In this connexion their attention may well be directed to articles which appeared in *The Times* of September 2, 8, 12, 19 and 21 on the subject of growing sugar canes, and which are full of valuable information. Canes are already produced in nearly all parts of India, and in the aggregate the production must be very large. A new kind of cane is mentioned as growing in some of the West India Islands, which yields 23 per cent of saccharose, and modern machinery is said to extract 90 per cent thereof. From such cane sugar should cost less than £5 per ton. By way of concluding these remarks a final suggestion is made to Indian indigo planters. Experiment at your factories on growing sugar canes, for the product from which there is an ample market at your own doors. Remember that the conditions of India in these days in respect of communications and otherwise are very much more favourable to the successful working of such an industry than in the days when sugar was largely exported from the country; also that modern sugar machinery is more efficacious in treating the canes; and if it can be clearly demonstrated that canes of the best kind can be grown successfully in Behar, and that a formerly existing industry can be established and extended, taking the place of indigo in that quarter if the worst should befall it, then assuredly the necessary modern factory will not fail to be established to deal with the canes.

Casuarina.—Though the Casuarinas is not of much value as a timber tree, it runs up quick enough to be a most valuable rain attractor and might with advantage be laid down on the bare jhumed slopes of the Assam midrange, wherever the rainfall does not exceed sixty inches. When the Madras Railway was first aligned the villagers along the route were induceed to plant casuarina which supplied the line with fuel for many years. Presumption as it may seem to parade such an idea, floods can be controlled by reforesting denuded tracts, and now that the Assam railway is entertaining the project of throwing out feeder lines in all directions, the necessity of protecting the earthworks from breeching as much as possible is imperatively called for.—*The Planter*, Jan. 13.

Coffee in Brazil.—From the *Rio News* of December 5th we note the committee of coffee merchants estimate at 2,250,000 bags the Rio coffee crop for 1900-1901. The committee says that coffee in elevated and cool localities has suffered very little from drouth.—We see by the report of the last half-yearly meeting of the Recife and Sao Francisco Co. that coffee planting in the state of Pernambuco has been receiving considerable attention and that the product, though small as yet, is steadily increasing.—The governor of Rio de Janeiro has sanctioned the assembly resolution of the first inst. which concedes next year 0·02 of the proceeds the export duty of coffee to be applied to the expenses of a propaganda abroad in favor of Brazilian coffee. The same resolution also concedes exemption from export duties on all coffee sent abroad for propaganda purposes.—The Sao Paulo *Diario Popular* of the 27th ultimo is informed that a practical and credible planter expresses the opinion that the abundant rains lately experienced will develop the coffee produced from the extemporaneous blossoming of June last so that it will ripen in January, or in February at the latest. As it will be impossible, in the present state of the industry, to find labor for a partial gathering of the crop, he thinks that this part will be wholly lost, thus greatly reducing the reason's crop.

Tea Distribution the "Thirty Committee."—Several of the subjects discussed at the last meeting had been previously considered by the Planters' Association Committee, such as the proposal to reduce the grant for America, and are referred to in our note dealing with the proceedings of that body. The amount voted to Mr. Mackenzie is £10,000 and a similar sum will be expended by Mr. Renton in pursuing his work on the Continent of Europe where it is considered that there are larger markets to be gained than in America. An interesting report was submitted on the manufacture of green tea on Brunswick estate and it should be a guide to those who are desirous of taking to this to supply the demand from America. Another very important matter that was discussed was a scheme for the protection of Ceylon tea in packets at home and abroad, and we look forward with interest to the result of the conference to take place between the Principal Collector of Customs and the Sub-Committee on the subject. We trust that steps will be taken to obviate the complaints that have been formulated by the Russian, and other tea buyers in the local market regarding slack packing and inaccuracy in the nett and irregularity in the tare weights.

THE DISTRIBUTION OF COCONUT PRODUCTS IN 1899.

RAPID RISE IN THE "DESICCATED" TRADE.

A careful study of the Chamber of Commerce Export Table which we issue as a supplement, discloses many items of great interest; and not the least interesting particulars relate to the distribution of the products of the Coconut Palm. Without any special organisation to push them into foreign markets, such as the enterprise and pluck of the Tea Planter have devised for his great staple, the range of their distribution is steadily extending, partly through their inherent excellence, and partly through the continuance of old-fashioned mercantile methods which are by no means ineffective. Other nations have undoubtedly been taking great commercial strides—it would be strange if they did not benefit by the example of British enterprise wherever they turned; and in some respects they have, perhaps, outstripped us by their greater pliancy and readiness to adapt themselves to circumstances; but that there is any falling-off in the commercial interests and alertness of the British race, is only what the tendency of the race to be their own severest critics suggest. When we look at the Chamber of Commerce Tables we find that our palm products find their way into almost every land on the face of the earth, and into not a few which are themselves producers. Just as our Teas have been shipped to our two great rivals, China and India, so Coconut Oil, Copra, Coconuts in the shell, find a place among the imports of the Straits, India and Africa, which grow their own palms! The process of development and expansion is particularly noticeable with regard to the Desiccated Coconut which, finding a place in our tables for the first time in 1891 with less than 1½ million lb., has mounted up in eight years to more than 13½ million lb.; while the taste for it has spread from the United Kingdom until, already, 12 out of 19 countries named in our commercial table are reckoned among the consumers. Though it would be too much to expect the demand for it to continue at the rate indicated by the growth of export during the past nine years—indeed the proportional advance during the second four years is far short of that shown in the first five years—there is no reason to fear that there will not be a steady, if slow, growth, as the new markets enlarge their orders; and thus one element in the maintenance of fair prices for nuts will continue to be present.

But after all, it is the price of Oil, and the demand for it, which is the chief controlling influence in the price of coconuts; and for the simple reason that Oil manufacture takes up as many nuts, as all other processes combined. In our recent review, we showed that in 1898 Oil represented 217 million nuts out of a total export of 390 million; and last year the figures were 200 million out of 331. The destination of the Oil and the demand for it is therefore of peculiar interest. In 1897 there was a sudden and serious falling-off in the demand from the United Kingdom, which ran down from 91,710 cwt. to 72,004 cwt., and which caused some anxiety which was, however, allayed by the good offices of a customer nearer home. India nearly doubled her orders from 86,796 cwt. in 1896 to 166,238 cwt. in 1897, and placed herself at once *facile princeps* among our customers, America coming second with 88,060 cwt., and Singapore a good fourth with 64,058 cwt. The revolution that was expected in the trade from these figures did not come off; for in 1898, the United Kingdom advanced her demand to 123,316 cwt., though still leaving India with its 125,687 cwt. at the top of the list; while Singapore put in a claim for 91,893 cwt. and America contented herself with 65,800 cwt. These were the principal figures which went to make up the total of 435,933 cwt. in 1898, which, though higher than the figures for the three previous years, were exceeded in 1894 by over 50,000 cwt., and in 1892 by 115,000 cwt. The exports of Oil last year have upset all the calculations based on those of the previous two years; for Singapore's demands dwindled off to 23,336 cwt. or about one-fourth what it took off in 1898, and India was content with 66,728 cwt. or less than half the previous year's consumption. On the other hand, the United Kingdom took a mighty stride to 185,205 cwt. or not much less than half the total exports; while America took total second plaee with 102,767 cwt. What is the explanation of these violent fluctuations? The demand for Europe and America, we know, is greatly controlled by the abundance or scarcity of animal tallow; but we should be glad of information bearing on the immense variations in the figures for India and the Straits.

In Copra, there was a falling-off as compared with 1898 during which an unprecedented demand sprang up—506,277 cwt. having been sent off, or about four times the previous highest record. As we noted last year, the principal customer was Russia which had to be credited with 143,688 cwt., or considerably more than the total that had been sent away in any previous year. In 1899, too, she heads the list, but with only 104,968 cwt., little Belgium coming next, as in the previous year with 76,634, and France next with 44,232; while Germany was content with 26,454. The demand of each of these countries were much heavier in 1898, and more than double in two instances while the Mother Country, so far from coming to our rescue was content with 37,106 cwt., or about 15,000 cwt. less than in 1898. To what is this falling-off all along the line due? Was it scarcity of freight? or were the previous year's purchases pushed on through competition beyond all reasonable requirements? That is not improbable, having regard to the enormous quantities that were sent away. The fact that the quantity exported last year, though only two-thirds of that claimed for 1898, is yet far ahead of any previous year, and more than double, if not quite treble, of the best, gives hopes that the demand will continue, and that Russia will prove our best customer in the future as in the immediate past.

In the demand for Desiccated Coconut, the Mother Country takes the lead, having absorbed nearly 9½ out of the 13½ million lb. we ex-

ported, or about eight times as much as either Germany or America who were our two best customers with figures over a million. Australia comes dutifully next with 814,266 lb., the other customers being Austria, Belgium, France, Holland, Spain, Turkey, India, Africa and China. If all these countries take kindly to the new product, the demand may yet surprise and please the producer; meanwhile, we may be sure the United Kingdom does not consume all she imports, and that the secret of the profitable uses she puts the stuff to, will leak out, leading to direct brisk business with us. In Coconuts, too, the Mother Country heads the list, having imported more than 10 million nuts of the 11¾ we sent away, Africa and Germany among next with 693,385 and 652,480 respectively. Belgium and Germany continue to be the two largest of our few customers for Poonac—the former having taken nearly half our exports, and the latter 14,000—cwt. less. Coir, in the forms of rope, yarn and fibre, found their way to the old markets, the United Kingdom taking none of the first-mentioned 6-7ths of the second and over one half of the last. Singapore absorb almosts all our rope—China, Africa, India and Australia taking small supplies. It is too early to venture on a forecast of the current year, but we fear the two droughts of last year will tell on the outturn of the current year as well; so that, if the demand for Oil and Copra from all the countries which we now supply continues, prices are likely to rule high.

BLEEDING OF WOODY PLANTS.

Professor H. Molisch has made a variety of observations on the flow of sap from woody plants when wounded. In the case of palms, cocos and arenga, the bleeding, when the inflorescence is amputated, is not due to root-pressure. No sap escapes from borings at the base of the stem, though it pours out abundantly at higher parts, even at a height of 19·28 metres, when the tree is in full leaf. The spadix continues to bleed for one or two days after being amputated. The origin of the osmotic pressure appears, therefore, to be not in the root, but in the axis of the inflorescence in cocos, and in the upper part of the stem in arenga. In three woody plants, natives of Java, *Conocephalus azureus* (Moraceæ), *Laportea crenulata* (Urticaceæ and *Bambusa sp.* there is an abundant bleeding from the stem, with very considerable pressure, up to two atmospheres, even at the time when the plant is in full leaf. The temperature during (our) winter months is very high day and night, with a constantly cloudy sky and daily rains. From incisions in the stem of climbing plants there is a copious flow of sap, both in the tropics and in European species. The sap flows from the vessels, thus explaining their unusual size in climbing plants. The flow is a purely physical result of the exposure of the vessels on both sides, and shows that capillarity cannot play the part either of a water-retaining or of a water-raising force to any considerable extent. The phenomenon takes place in *Vitis* and *Climatis*, in the height of summer even in dry weather and intense heat.—*Journl. Royal Micro. Society.*

COCHIN MARKET REPORT.

Cochin, 20th Jan.

C. N. Oil.—With a large supply of copra as usual in this part of the season coupled with the steady rise in exchange prices do not shew any improvement. Business done this week in the bazaar for ordinary white oil both for prompt and forward deliveries is at R86/4 to R86/8 per candy. Good white oil is quoted at R85/8 nett. The "Obra" which has been substituted for the "Goalpara" calls here for Rangoon probably tomorrow and removes a few hundred casks. The "Inchmona" for New York due early next month has also booked a large quantity of oil in that direction.

Coir Yarn.—Supplies have fallen off considerably and the quality of yarn now arriving as usual at this season is also very poor. Prices however keep steady.

Rice.—Chittagong boiled R6/7 to R7 per bag. Rangoon white R6/12 to R6/13.—*Cochin Argus*, January 20th.

Indian Azaleas.—In some of the Ghent establishments as many as 100,000 plants are grafted each year. As soon as union is effected the plants are placed in frames in the open air. In the middle of May they are lifted from the frame and planted in dried leaves. Leaf-mould is not so advantageous. Weak liquid-manure judiciously used is beneficial. An illustration in the January number of the *Revue de l' Hoticulture Belge* shows a plantation of Indian Azaleas in the open air in the nurseries of M. Ed. Pynaert.—*Gardeners' Chronicle.*

Tea-growing in the Caucasus.—Though the day is very far distant when Russian experiments in tea-growing near home can injuriously affect the demand for Ceylon tea in the Russian market, it is of interest to note what a St. Petersburg correspondent writes in the *Grocers' Journal* of Dec. 23rd He says :—

"The tea plantations in the Caucasus are becoming of greater significance every day, and the time may not be far distant when the Caucasian tea will play an important part upon the Russian market. The Government is paying special attention to, and energetically assists, the experiment. For the first time this year Caucasian tea has been placed upon the market, and two important Moscow tea merchants have offered to buy the whole produce for some years to come, but up to the present no agreement has been come to, owing to the difference in the price. It is hoped that one pound of Caucasian tea will be sold at 1,40 rouble similar to the quality of Chinese tea usually sold at 2 roubles. A special commission sent to Tschakwa has reported favourably upon the results already achieved, and it has been decided to pay still greater attention to the plantations. The Minister of Agriculture, however, instructed a high official to proceed to the Caucasus with the view of instituting a thorough inquiry, and to make suggestions accordingly. In his report he proposes the extension of the plantations beyond Batoum, and in order to induce small landed proprietors and peasants to take up this industry Crown lands are to be let in allotments. Further pamphlets dealing with the question are to be sent broadcast amongst the country people. All machines and tools required are to be admitted free of duty, and special credit advantages are also to be extended to those willing to engage in tea planting."

RUBBER CULTIVATION IN SOUTH INDIA.

(BY A PLANTER,)

IN VIEW OF THE EXISTING DEPRESSION IN THE COFFEE industry, and the uncertainty attending the future of the staple, as well as of tea, it would be wise policy for the planting community in Southern India to study the potential attractions of rubber cultivation. Twenty years ago, considerable attention was aroused in South India as to the possibilities of the Ceara, or Manicoba rubber (*Manihot glaziovii*) proving profitable, and this tree was grown, mainly from cuttings, on many properties in the planting districts, while it was even tried in the vicinity of Mettapollium, at the foot of the Nilgiris. But from circumstances, which it seems unnecessary to recapitulate, interest in Ceara, despite its robust and rapid growth, gradually languished, and the trees have been generally uprooted, while the venture never travelled beyond the experimental stage. Some, if not the majority, of the planting localities in Southern India are reputed to possess a more fertile and productive soil than Ceylon, though the climate of various Provinces in the island has a greater degree of continuous humidity than the general average of the Hill plateau in the Madras Presidency, Coorg, Mysore and other notable tracts; but as Para and Castilloa are said to thrive in comparatively moist and dry climates, respectively, it follows that if conditions in Ceylon have been shown to be suited to the successful growth of the Hevea (or Para) and the Mexican (or Castilloa), that South India offers a varied field for kindred enterprise.

THE WHOLE QUESTION OF RUBBER CULTIVATION has recently assumed a new aspect in consequence of the discoveries of Mr. Biffen, of Cambridge University, a qualified botanist, who investigated the method of preparation in Tropical America with much care, and such success that the loss of rubber from the latex in the manufacture has been reduced from 10, 15 and even 40, to 1 per cent. The milky fluid, or latex, which exudes from various plants when abraded, is altogether distinct from the sap, as it is stored in special receptacles, which run longitudinally within the other tissues and generally form a connected and closed system. This lactiferous tissue, though not altogether absent in the vegetation of temperate regions, is specially characteristic of tropical flora, and the latest and most approved methods of collection and treatment of the latex is a powerful factor in revolutionising the result heretofore obtained in this profitable industry. By the aid of Mr. Biffen's machine, which is on the principle of the cream separator, he can, in a few minutes, extract the pure caoutchouc from the milk of any species of rubber tree, and the product thus obtained is practically identical whether evolved from the Para, Ceara, or Castilloa species, though the most satisfactory results accrue from the latex of the *Castilloa elastica*, which can be grown in the drier parts of hill tracts, whereas Para, in its native habitat, revels in moist lands, the borders of rivers, and inundated areas, thriving rapidly from the sea level up to 3,000 feet and over in any such soil. The rubber-extracting machine is something on the principle of a churn, composed of galvanised iron, and standing between 18" and 24" in height. A quart of the rubber milk is poured into the upper compartment and diluted with water. These form a species of cream, and by revolving a handle at the side the composition is driven through an extremely fine gauze sieve, which effectively isolates the rubber from all impurities. The rubber then descends into the lower and larger partition in the vessel, (where it is further diluted with water, introduced through an orifice in this lower receptacle) washing it free of what was mingled with it, and gradually rising as the compartment is filled, when the rubber, which has risen to the surface, is easily extracted through another aperture for the purpose. The water is then drawn off by a tap, and the procedure repeated indefinitely. The rubber extract is perfectly flat and thin, totally dissimilar to the rough balls produced by the native processes, while it is practically capable of any degree of distention. The sieve in the machine is moveable, and is retained *in situ* by a firm boss of metal, so that the whole apparatus can be easily taken to pieces and cleaned. The only further treatment of the rubber consists in spreading it out for a time to dry, when any slight moisture that may be retained is dissipated.

CEARA TREES may be propagated either by seed or through the medium of cuttings. The seed coat being of remarkable thickness, its natural germination may be prolonged for months; but this result can be more speedily insured by sowing the seed in a shallow box, or brandy case, into which about three inches of fresh stable manure has been smoothly spread, the straws having been carefully removed. The seed should be thickly laid on the smoothed surface of the manure, and then covered with a similar coating to the same depth. The whole should be kept damp, and nothing more is requisite till the germination takes place, in from seven to ten days, shortly after which the plant shows above the manure, when transplanting into a nursery or seed baskets must be effected. Para seeds, which are as large as nutmegs, can be put down in a nursery, shaded and watered, and here they germinate within eight weeks. The seeds can also be planted at stake in showery weather. For inundated tracts, old plants of two years and upward are stumped and planted out two feet deep, as seed or small plants are liable to be scoured away. When planted out, they should be suitably shaded until established in the soil. Under favourable conditions, new roots are developed within a fortnight. Castilloa seed should be grown in an ordinary shaded nursery, laid out on rich soil, the seeds being put in six inches apart and one inch deep. A watering in the evening once a week suffices, under which system the seed germinates in five weeks. When the plants are half a foot high they should be removed to seed baskets, filled with the richest soil available. Subsequently, and when thoroughly established in the baskets, the latter should be placed in pits two feet square and three feet deep, cut 14 feet apart.

In considering how far the Districts in Southern India are likely to lend themselves to the profitable cultivation of PARA and CASTILLOA rubber trees, the circumstance should be noted that the yield of the latex, or rubber, extracted from supplies grown in Ceylon is considerably below that accruing from the same varieties in their natural habitat. But Ceylon contains no indigenous rubber-producing trees of any value, and even the milk of the jak, breadfruit and other introduced trees, which elsewhere contain caoutchouc, when grown there have none. Whether Southern India shares this peculiarity can only be determined by special tests; but, so far as experiments in the yield of the latex from these species have proceeded in Ceylon, the results should prove interesting and instructive to South Indian planters. Mr. J Willis, Director of the Royal Botanical Gardens, Ceylon, reports of the Para:—

"It succeeds best on flat, wet, alluvial soil, at very low elevations, but in sheltered positions will thrive at elevations of over 3,000 feet though the growth is of course slower. Best results have been obtained by planting eight or ten feet apart each way; the trees thus form their own shade, and keep down the weeds, a process of natural selection goes on, and the more weakly and dwarfed trees may be thinned out in subsequent years. Another advantage of close planting is that the trees grow up straight without forming many branches low down, and this greatly facilitates tapping. Para is a surface-feeding tree; probably the best thing would be to plant out the tree among tea or other products, at considerable distances apart, the tree will then grow to a large size in less time than if kept in plantations of rubber only, and their rubber will form a useful minor product."

After being grown for several years amongst tea fields in Ceylon, the Managers of various properties report that Para rubber, approximately two years old,

some of the trees being 18 feet high, is apparently "not injurious to the tea," and that "all our Para and Castilloa rubber, from six to two years old, is growing through the tea, with no damage to tea at present—trees 30 feet high and 27 inches girth at three feet from the ground." The statistics available as to the yield of rubber from Castilloa and Para trees in Ceylon are so far incomplete. It is, however, known that the yield of rubber in the Straits Settlements is in excess of the best returns in Ceylon, and this is mentioned in connection with Mr. Derry's Report on Government Gardens in the Straits for 1897, from which I quote the following:—

"How for this industry is deserving of attention may be inferred from the following moderate estimate. Para trees planted 14 by 14 feet equal to 225 to the acre:—

Age.	Yield per tree.	Yield per acre e.i. 1 tree by 225.	Gross value per acre estimated at 2s per lb.		
	oz.	lb.	£	s.	d.
6	10	140½	14	10	0
7	18	250	25	0	0
8	26	365	36	15	0
9	34	478	47	13	0
10	42	590½	59	10	0

The importance of close planting is not generally realised. Planted at 14 by 14 feet, against 25 by 25 feet, would possibly result in a difference of one year in six, in favour of close planting. I am of opinion that planted 14 by 14 the trees could be tapped in the fifth year, if not earlier. Para rubber is a remarkably adaptable tree, growing in swampy land, or dry high ground, without, so far as I have tested, any difference in the yield of rubber."

Ere long I shall probably have more complete figures as to the yield of rubber from Para and Castilloa in Ceylon, but I have heard enough to show that the cultivation of these rubber trees promises to be a very profitable venture in that island, and I believe that excellent results await the enterprise in South India. Castilloa seed appears to be difficult to procure, but fresh Para seed is now available on application to Messrs. William Bros., Henaratgoda, Ceylon, at R5 per 1,000.—*Madras Mail*, Dec. 30.

CEYLON TEA EXPORTS: ESTIMATES (1900) AND RESULTS (1899).

We have brought together below some figures which present in comparative form the estimates of our tea exports to the chief countries served, for 1899 and 1900, together with the quantities actually sent away during the past year. The estimate for Russia in 1899, it will be seen, was 50 per cent too high; but seeing how greatly the Colombo market has been cultivated by the Russians during the past twelve months, we are not surprised to see the official figure is 6 million lb. again this year. The requirements of Australia also were over-estimated, but not excessively, and the estimate this year is, therefore, reduced by a million, merely—that is, put at 400,000 lb. ahead of the quantity sent southward last year. As for America, it is no doubt a little surprising to see the estimate for this year nearly doubling the exports of last; but—and it is a point to which we have already drawn some attention—we are convinced that what is put down in the Chamber of Commerce list for 1899 as exported to China, *i.e.* 1,384,490 lb., is really (or at least the large bulk of it) intended for transhipment *via* Hongkong to San Francisco or Vancouver, for California, British Columbia and Western America, generally. Thus the exports to America in 1899 would then amount, roughly, to 4,464,492 lb. instead of 3,080,002 lb. as given in the table. Hence, perhaps, comes the justification for the extraordinary reduction of the 1900 estimate for other countries as compared with 1899, by one-half, or by 800,000 lb. on the total quantity exported last year—in the latter case the exports to China being more properly counted in with the estimate for America. The total estimate for all countries other than the United Kingdom is four millions ahead of what was sent to them last year—a fairly accurate calculation, we believe it will prove—and two millions behind the estimate for 1899. The United Kingdom, however, took 10 millions more than was expected last year, so the estimate is increased by 15,000,000—or five millions ahead of the exports in 1899. Finally, the total estimate for 1900—namely 138 millions—appears to us a rather liberal one. We have hitherto experienced that the yearly increases are alternately large and small. The increases since 1891 are roughly as follows:—

1891	...	21,300,000
1892	...	2,900,000
1893	...	13,300,000
1894	...	100,000
1895	...	13,400,000
1896	...	10,200,000
1897	...	7,900,000
1898	...	3,700,000
1899	...	10,100,000

Up to 1895 it is evident that the theory of alternation held good. In 1896 the fall is smaller owing to the quantity of fresh estates coming into bearing and to the fame that Ceylon tea was beginning to win for itself throughout the world; the figures of 1897, where we should have expected an increase, in reality balanced the smaller drop of the previous year, and in 1898 and 1899 the theory again holds good. Thus it appears to us, judging by the last 10 years, that the 1900 estimate is rather too high and that January 1901 may find us with nearer 135,000,000 lbs. exported for the last year in the century than 138,000,000. However, this remains to be seen, and with so much depending on weather, labour and even prices, it is impossible to dogmatise. Meanwhile the following from last Sunday's *Pioneer* is curiously inaccurate:—

The Exports of Indian Tea during the calendar year 1899 amounted to over 151¾ million pounds against 136 millions in 1898. The exports of tea from Ceylon rose to nearly 121 million pounds as compared with less than 111½ millions.

"121" should be 130, while "111½" should be "119." We should need to go back to 1896 to find one year's exports below 110 millions.

The following are the figures for Ceylon commented on above:—

	Estimate, 1899.	Result, 1899.	Estimate, 1900.
Russia ...	6,000,000	3,949,740	6,000,000
Australia ...	17,000,000	15,606,833	16,000,000
America ...	4,000,000	3,080,002	5,500,000
Other Countries ...	5,000,000	3,309,457	2,500,000
	32,000,000	25,946,032	30,000,000
United Kingdom ...	93,000,000	103,948,124	108,000,000
Total ...	125,000,000	129,894,156	138,000,000

THE UTILISATION OF SEWAGE.

THE improvement of agriculture, through the aid of sewage is, of course, by no means a new question; but it is of particular interest to us at the present time, when Colombo is considering a scheme for the disposal of its sewage, and the rate-payer is threatened with a burden which may prove intolerable. Nor does the fact that the Nagpur Experimental Farm lies within British territory, on the adjacent continent, lessen our interest in its experiences. On the contrary it should stimulate the desire of our Municipal authorities to make enquiries with a view to ascertain how far those experiences can be reproduced here. The matter is one affecting both sanitation and finance, with an important bearing on agriculture, which, too, has lately demanded special attention locally. The *Friend of India* writes :—

Progress in the difficult task of elucidating the complex ways of Indian agriculture continues to be slowly made at the Nagpur Experimental Farm. The report for last year shows that a complication has been introduced by what seems to be some insidious form of plant disease which affects alike wheat, *tur*, and linseed. The experiments have been persevered with steadily, however, and in more than one direction encouraging results have been obtained notably in the success which has attended the application of fresh sewage manure, on the plan devised by Lieutenant Meagher of Allahabad. The Commissioner of Settlements state that the yield of *juar* which this method gave last season on the farm was phenomenal—nearly three thousand pounds of grain to the acre; while bumper cotton crops were picked on fields that had been thus treated. He thinks that, if extended to all municipal areas, it should enable large crops to be grown in their vicinity and give Municipal Committees some income from the disposal of sewage. The same experiment, it seems, had been tried with success at Deoli, in Wardha, and steps are now to be taken, through the Central Provinces Government, to try it elsewhere also. The system is described as simplicity itself, the sewage being merely deposited in very shallow furrows and covered up lightly with earth. Another successful experiment made last year was that of treating *juar* seed with cupric sulphate before sowing, as a preventive against smut. Valuable results were also obtained with an improved variety of wheat which is being introduced through the agency of the Farm. Special attention, we learn, is now to be directed to the last-mentioned branch of the operations, the introduction of varieties superior to those already in the hands of the cultivator being one of the most promising of the means of utility open to an institution like the Nagpur Farm. The Report does not say much about experiments in the direction of the selection of seed. Such extraordinary results, however, have been obtained in Europe by this means, in the case of all sorts and descriptions of agricultural plants, that it will be of the greatest interest to see it taken up more widely in India.

VANILLA DUTY REDUCED IN FRANCE.

With the idea of fostering the vanilla trade, the French Government have resolved to reduce the present duty on the importations from Tahiti and its dependencies into France by fifty per cent. This applies to the extent of the first 10,000 kilos.—*Chemist and Druggist*, Jan. 6.

THE BALLAD OF THE RAILWAY SLEEPERS.

How do the sleepers go down to the plains?
  I went to discover this once on a time:
And blessed with some leisure, I'll tell you in rhyme.
  Up on the mountains so blue and so far
They are felling the cedars and stout deodar.
  For yearly in Delhi the Managing Staff
Demand good sleepers, a lakh and a half,
  For their metre gauge railway which via Ajmere,
Bears back the exile toward England dear.
  The sawyers have shaped them with axe and saw
Six feet of length without knot or flaw,
  And the coolies have borne them a mile or so
Down the steep home of the buck and doe.
  Another mile round the mountain side
On a man-pushed tramway the sleepers ride.
  Hence to the plain how shall they go?
For it's still six thousand feet below.
  Here down the steep is a sledge-car road
Fifteen sleepers make a load.
  Give them a push and away they fly
A hundred feet in the twink of an eye.
  Or if you prefer it on wire of steel
They can cross a valley with even keel,
  For twenty seconds flying there
Through twice seven hundred feet of air.
  Now they meet an aqueduct
Neatly against the mountain tucked;
  Breadth ten inches, joining strong,
Downwards ever it leads along.
  So let water do its part.
Throw them in and give them a start
  Sometimes swift, and sometimes slow
With the water, along they go.
  Here at length, they reach the shoot.
A thousand feet from top to foot.
  See the water leap and gush
Startled out by their downward rush;
  Once again on a gentler grade
On they speed through the forest shade
  Now they're nearing the valley bed
Stream of the Kulni watershed
  Over the stage like boys at school
In they plunge to a limpid pool
  Now beware of an awkward block,
Full six miles, of shallow and rock.
  Line the sides with built-up sleepers
And make the channel narrow, but deeper.
  Then when the rest of the Army's gone
Pull down the sentries and pass them on
  Yet twice the moon must wax and wane
E're the stream assumes its wont again
  And the last of the fifteen myriad hoard
Launches forth on the river Broad.
  So from Kulni to Tons and Gons to Jumna
Sails the mountain's late alumna;
  Past the Siwaliks and through the plains,
Till the Delhi ramparts at length it gains.
  Now take it over you Railway lot;
Let the sleeper sleep in its ballast cot.
  Lay it to rest, (it has travelled far)
In the permanent way of the R. M. R.

—*Indian Forester.* E. F. E. W.

COCOA BUTTER was discussed at the Society of Chemical Industry on June 5th. Dr. J Lewkowitsch pointed out that all text books stated that it could not go rancid, which was distinctly wrong, and he said that the error had arisen from confounding acidity with rancidity, while as a matter of fact they were not synonymous.—*British and Colonial Druggist*, Dec. 29.

COCOA BUTTER DEARER IN AMERICA.

Values in cocoa butter for both bulk and cake are still advancing in a manner that occasions considerable surprise to not a few. At the most recent sales in both London and Amsterdam the prices obtained were on a higher level than those of the last previous auctions. At the time of sale in the latter city our correspondent informed us by cable that the offerings were disposed of at an average price of ninety-four Dutch cents per half-kilogram, which compares well with the price of ninety-one cents at the previous auction, in November, and even more favorably with the average price recorded at the October auction, which amounted to eighty-eight Dutch cents. With largely depleted stocks in this country, the consuming demand has grown to be of considerable proportions, while the purchases to supply the large current requirements have mainly been of a hand-to-mouth character. Importers in this and other American markets are, generally speaking, in no position at present to supply cocoa butter in considerable quantities, and with the demand being what it is, the recent stiffening of values is not to be wondered at. A factor, however, has lately entered into the situation that is becoming of increasing importance. As prices have commenced to assume the high level recently prevailing, a large part of the manufacturing and consuming trade have in consequence had recourse to the purchase of what is now offered by several dealers as a substitute for cocoa butter, for confectioners' uses. The prices prevailing for this article are less than one-half of what is quoted for the regular goods, and it is reported that the demand for it has lately become quite large. It is, of course, doubtful to what extent this can figure as a future factor in the situation, but it is unquestionable that the business in the article is already large and growing. Although trade sentiment is somewhat at variance regarding future values in the real butter, and the holders' views are expressed only with the greatest diffidence, the prevailing sentiment seems inclined to the view that prices, although not likely to be seriously checked for the near future, have reached the level where any further large appreciation is not thought probable.—*Oil Paint and Drug Report.*

A NEW TEXTILE PLANT.

Some years ago, an explorer in Asia discovered a plant of silken fibre, used by the Turkomans for the manufacture of withes and cord, and by the Canagues, for woven goods. This plant, known as *Apocynum venetum*, is a sort of bush with slender cylindrical branches, sometimes 6 feet high. It grows in Europe, Siberia, Asia Minor, the north of India, Manchuria and Japan but is not cultivated, and, up to the present has been used only in the natural state. The branches die yearly, and in the spring new shoots start horizontally from the roots. It flourishes best where the land is under water during a part of the year, notably in the neighbourhood of rivers that overflow at stated periods. Under favourable conditions the *Apocynum* develops quickly, and in a short time the branches form a thick growth, almost like a miniature wood. The best fibre is obtained by cutting the branches in midsummer, when the plant has obtained its full growth. The attention of the Russian Government was called to this plant in 1891. It is there known as the *Apocynum sibericum*, because it was first seen in Siberia. It grows luxuriantly on the banks of the Amu-Darya, and the Ili, and the natives of the regions have used the fibre for many years for cord and fish nets. They value it not only for its great strength, but also because no care is required in its cultivation. In 1895 the Russian Government began to use it in the manufacture of bank notes, and since then the plant has been cultivated at Poltava. The results obtained thus far are considered excellent, and the time is doubtless near when the *Apocynum venetum* will take an important place in the textile market.—*Commercial Intelligence.*

MINOR PRODUCTS REPORT.

London, January 4.

Cinchona.—The Nederlandsche Veen cinchona bark department at Amsterdam report that the shipments from Java to Europe were as follows :—

Amsterdam lb., December—

1899	1898	1897	1896	1895
626,000	1,018,000	731,000	890,000	634,000

January-December—

1899	1898	1897	1896	1895
11,409,800	11,150,000	8,437,000	10,079,000	8,827,700

The exports from Ceylon for the week ending December 12th were 1,137 pounds only.

Citronella Oil.—At the close of last week business was done ton-lots at 10⅞d to 11d per pound, c. i. f., and at 10¾d landed terms, in large drums.

Quinine has improved to the extent of half pence per ounce in second-hand in consequence of small bark shipments from Java during December. With the exception of sales on Tuesday, when about 150,000 ounces changed hands at 1s 3½d to 1s 3¾d spot and 1s 3¾d to 1s 4d for March, the market has been quiet, and on Wednesday prices were a shade weaker. Today a good business has been done at 1s 3¾d to 1s 4d for March delivery.

There were no exports of Java quinine from Batavia during October; from July 1st to October 31st, 1899, the shipments have been 562 cases against 499 cases.—*Chemist and Druggist*, Jan. 6.

USES OF THE EUCALYPTUS.

Mr. L. F. Woolrych, of Cooma writes:—It has struck me that a few notes on some of the uses to which different parts of the various encalyptus trees are put would be of interest. The encalyptus family is truly to the Australian what the palm is to the Eastern peoples, spread as it is all over the continent and always within reach. In Europe it is a common belief that the trees of our forests throw no shade, but for shade and shelter purposes many of them are invaluable, as well as for their beneficial effect in connection with miasma arising from swampy ground. In New Caledonia the ti-tree (*Melaleuca*) is planted for the latter purpose. Then the young leaves may be used for poultices, or as sticking-plaster, which will only wear off. One variety (*E. obliqua*) called here stringybark, will provide the selector's fence, gates, slabs for house, and bark for the roof, as well as firewood. The fluffy part of the bark is splendid for kindling purposes, and the inner bark makes excellent ropes, ties and make-shift harness. The bark will also make good pipes for carrying water. The gum is often used as a medicine for sick fowls, and is also a good bush remedy for desentery, as old bushmen have told me frequently; and it makes a good varnish when dissolved in spirits of wine. The honey from the eucalypti is, if used in quantity, said to be a violent purgative, but if consumed in the ordinary way is a mild aperient. In fact one might go on for a long time before the list of uses to which these valueable trees can be put would be exhausted.—From the *Agricultural Gazette*, of New South Wales.

Cinchona.—In a specially translated article by Dr. L P Lotsji, Dutch Government botanist in Java, published in our issue of January 6th, on the localisation of alkaloid in cinchona plant, the conclusion was arrived at that the alkaloid was not contained in the sieve vessels but in the parenchyma; in the younger parts, in solution in the cell sap; and in the older parts in an amorphous solid condition.—*British and Colonial Druggist*, Dec. 29.

TROUT OVA FOR NUWARA ELIYA.

The N.D.L. ss. "Bayern," which arrived from Europe on January 26th, brought out a consignment of 10,000 trout *ova* for the Ceylon Fishing Club. Like the previous consignment, the present one is from the well-known trout farm of Messrs. Andrews and Andrews, Guilford, and is to be put into the hatchery at Nuwara Eliya. Another consignment of 10,000 brown trout *ova*, is expected by the middle of this month; while the third and last batch, of 10,000 rainbow trout *ova*, is expected in March.

The above reminds us that Mr. Fraser, of Abbotsford, attempted on his present voyage to convey a consignment of perch. They were duly shipped on the P. & O. ss. "Oceana" in the Thames with full instructions, as Mr. Fraser was to join at Marseilles. When he did do so, he found the perch dead, owing, it is supposed, to the effect of rough weather in the Channel and Bay of Biscay. The Commander (Capt. Crawford—one of the most obliging of P. & O. Captains) when he heard of the experience, however, and the purpose for which the perch were being taken out, offered to arrange for another consignment and to give the same the greatest possible attention so as to secure delivery in good condition. This will be on the next outward voyage of the "Oceana," and we trust the experiment will be crowned with success.

TOMATO DISEASE IN N.S.W.

Several tomato growers about Sydney have been puzzled to notice fine healthy plants suddenly collapsing and dying as if struck all of a heap by the bubonic. This week, reports the *Sydney Telegraph* by last mail, the peculiar disease has appeared on a large scale in the Gosford district. Specimens sent to the Agricultural department have been examined, and found to be infested with the "sleeping disease of tomato, a fungoid known as "Fusarium lycopersici." The entomologist states that this is a very common disease in England, where it causes great losses to market gardeners growing tomatoes. It is likely to spread, as if the plants are attacked when in full fruit, as is often the case, the fruit may ripen, and appear, even under the miscroscope, to be perfectly sound, yet the seeds from such tomatos, if planted, will produce diseased plants. As the fungus first attacks the roots, and then comes up the stem, where it discolors the tissue and causes the sudden death of the plant, there is no remedy. Plants should be destroyed, and the soil treated with quicklime to exterminate the spores and keep the disease from spreading. The disease has probably been introduced through seed.

PLANTING NOTES.

RUBBER SUBSTITUTES.—Dealing with the three elastic gums which have been suggested as substitutes for rubber, Hooper does not consider that either of them are suitable for the purpose. He gives their characteristics. The first, obtained from the stem of *Ficus bengalensis*, dissolves, without previously swelling, in ether, chloroform and carbon bisulphide; the second, from *Calotropis gigantea* and *C. procera*, contains but little caoutchouc; and the third, which is the coagulum of the milky juice of *Excœcaria azallocha*, possesses irritating properties, and contains alcohol soluble resins—*British and Colonial Druggist.*

RUBBER-TREES.—The U. S. Department of Agriculture has recently issued some valuable information on the subject of rubber-trees. Experiments in India with certain species were not successful, owing to the fact that the trees did not develop the characteristic lacteal ducts. In the light of the work of the department's experts this was due to error in selecting the variety. Unless care be taken in this direction, failure will result in securing rubber, even though the trees may apparently grow well. There are four varieties of rubber-trees, which must be utilised according to the soil and climate of the place of cultivation :—

(1) *Castilloa elastica* grows well and produces rubber in places where the climate is hot, humid, and the soil drained.

(2) *Hevea brasiliensis*, is the climate be hot, humid, and the soil swampy or covered with water.

(3) *Manihot Glaziovii*, the Ceara plant, if the climate is hot and the soil dry, sandy, or stony.

(4) *Sapium biglandulosum*, in temperate or cold climates such as Florida, Louisiana, &c.

The last variety is especially suitable for growing on coffee plantations.

COFFEE IN NEW SOUTH WALES.—A farmer on the Lower Clarence, New South Wales, who is trying coffee growing, has just harvested 5,000 lb. of beans, which will produce about 900 lb. of ground coffee. The sample is admitted by experts to be equal to the best Ceylon in strength and flavor.—*Melbourne Leader*, Jan. 6.

STATISTICS OF CINCHONA CULTIVATION in India are published by Mr. J E O'Conor, under date Calcutta, Jan. 15. We quote :—

At the end of the official year 1898-99 there were 7,591 acres of land under chinchona cultivation, of which nearly 82 per cent was situated in Southern India, the remainder (18 per cent) being in Bengal. The area in Bengal, comprising 1,373 acres, lies in and near Darjeeling. Most of the area in Southern India is in the Nilgiris (4,531 acres). There are also 1,173 acres in Travancore, and smaller areas in Mysore, Malabar, and Coorg. In Bengal the chinchona plantations, which are the property of the State, cover 1,303 acres. In the Madras Presidency, on the other hand, the industry is mainly in private hands, the State Plantations covering only 874 acres. During the thirteen years ending with 1898-99 the area under cinchona has fallen from 14,491 acres to 7,591 acres. There has been a substantial decline in Bengal as well as in Madras, and in Coorg the cultivation has been almost entirely abandoned. The number of plants in permanent plantations has fallen in the same period from 28¼ millions to about six millions. In 1898-99, a little over four millions were classed as mature and nearly two millions as immature plants. The general reason for the decline is the fall in the price of quinine. The price fluctuates, and when a temporary rise occurs it is followed by the exportation of all the bark that can be collected from plantations owned otherwise than by the State. But the manifest general tendency of the price-level for many years has been downwards.

The quantity of bark collected fluctuates with prices. Bark collected (lb. Madras 1898-99 745,472. Bengal 251,529. Total 997,001. Exports (lb.) Madras 1,361,539. Total 1,361,539.

In Bengal most of the bark collected is manufactured by Government for issue to the State medical stores and to hospitals. In 1898-99 the Government chinchona factory produced 10,335 lb. of quinine sulphate and 3,921 lb. of cinchona febrifuge. The industry generally, apart from the Government operations in the Darjeeling district, has dwindled to unimportant proportions.

CEYLON CINNAMON EXPORTS AND DISTRIBUTION IN 1899.

If our apprehensions with regard to a short out-turn of coconut products for export, as a result of the two droughts which made themselves felt last year in the lowcountry, have unhappily been justified by the event, we cannot, unfortunately, claim to have been true prophets in our forecast touching Cinnamon. We say unfortunately, not from concern for our reputation as prophets, but because a redundant cinnamon crop is a very doubtful blessing; and in the present instance the exports have been swelled by nefarious means. The supply of spices can very easily outstrip demand, and no island industry has suffered so long and so severely from over-production as the Cinnamon industry. The prices ran down from two to three shillings a lb. in the "seventies" to less than a shilling in the "eighties," involving Proprietors in much embarrassment, if not positive loss; and the sligh trecovery during the past decade was a very welcome relief. The advantage gained is again threatened by over-production—the explanation being that prices which barely leave a margin of profit to cultivated estates, satisfy small native holders who neglect cultivation and attend to the preparation of the bark themselves. There has always been more or less adulteration in garden, as distinguished from estate, spice; but last year, under the stimulus of high prices and small crops in the earlier months, a new industry developed, in the shape of "Wild Cinnamon!" We have already expressed our belief that before the Collector of Customs and the Chamber of Commerce united to demand a separate classification for wild cinnamon, some of it had already been shipped as plantation spice, and hence it is that quilled bark showed last year a falling-off of only 19,025 lb. as compared with 1898, while chips disclosed an increase of 415,000 lb. The deficiency of peelable bark is naturally made up by scraping chips from coarse sticks; but the 1898 production of 1,414,165 lb. of chips had never been approached within 400,000 lb. and an increase on that large outturn of 400,000 lb. marks a stride which cannot be due to natural causes. In 1890 the export of chips was only 441,447 lb.—a large outturn as compared with previous years; and the development since then has been steady until a little over a million lb. was shipped in 1897, since when the growth has been phenomenal. The combined outturn of quilled bark and chips last year, amounting as it did to over 4⅓ million lb, beats all previous records, and does not disclose a healthy state of things. The figures for wild cinnamon, which began to be compiled only during the last few weeks of the year, were 195,008 lb. quills and 628,418 lb. chips. We reiterate our hope that the reception which this stuff met with at the November auctions in London will put an end to the trade, and that the shipments which have continued to go forward since then will only add to the losses of those who are engaged in the doubtful business. Their destination was the United Kingdom and Germany, and both countries should be warned by what Messrs. Darley, Butler & Co. have already written on the subject.

Turning to the Distribution of Cinnamon which has not been described as wild, the United Kingdom heads the list, having taken 1,121,128 lb. quills and 680,038 lb. chips, a quantity which is about 200,000 lb. more than in 1898 under each head. The next largest customer is Germany with 639,039 and 650,637 lb. respectively, which is less than she took in quilled cinnamon the previous year, the falling-off being, perhaps, due to the trial she is giving wild cinnamon? In chips, however, there is an increase which brings the total up to that of 1898. No other country approaches these figures—the third, in order, being Spain with 262,100 lb. quills and 65,900 chips; but this is a great advance on her requirements of the previous year. We welcome the improvement, not only as a contribution to the island's prosperity, but also as evidence of recuperation in the commercial position of Spain. We had already noted this, in connection with her renewed orders on the London market, which have helped up the prices for our best estate marks for which she has always shown a partiality; and this is further proof that she is shaking off the effects of her disastrous contest with America. Curiously enough, America shows a corresponding falling-off in the quantities she has taken—her figures having been 146,600 lb. and 28,000 lb. for 1899, which are about the same as Spain's for 1898. Spain is thus having her revenge in commerce for military and naval disasters! Our other principal customers for cinnamon were Italy, Belgium, France and China, whose takings ranged from 117,200 lb. and 144,220 lb. of the two sorts, to 45,000 lb. of the first alone. Turkey, India, Australia and Africa took small quantities, and they complete the list.

PLANTING IN ST. HELENA:

COFFEE AND TEA.

A paper by H.E. Governor Sterndale in the "Asiatic Quarterly Review" on "St. Helena in the Present Time," gives some interesting information. The people are very inoffensive, says the Governor:—During twelve criminal sessions, over which I have presided as Chief Justice, on all except two occasions have I received white gloves. Civil litigation is common enough. They are kindly disposed one to another, showing much sympathy in sickness and trouble, and are courteous to strangers, who are generally much struck by this, and by the comparative purity of the English spoken by them. Their faults are lack of energy in overcoming difficulties, and their proneness to accept a failure as a finality—take, for instance, vine culture. I remember in years gone by

SPLENDID GRAPES IN ST. HELENA

but the vine disease was introduced and the vines perished, never to be replanted. The same thing happened in Madeira, but the people there took heart and tried again, and with success. It is a common story in St. Helena, "Oh yes, I remember such and such things when I was young, but they died out long ago." That lemons were common in the island is proved by the many places, such as Lemon Valley, Lemon-tree Gut, etc., being called after this fruit, which is now extinct and has to be imported from abroad. And with peaches, the same story of the good old days—no finer peaches to be seen anywhere, but now from ungrafted,

unpinned, in every way neglected trees, miserable, worm-infested crops of worthless fruit are gathered. Providence has been kind to the coffee-tree, which still flourishes and bears abundant crops of excellent coffee of the old Mocha stock, but for all the care that man takes, it might have gone the way of the grape and the peach. I, who have seen the care, the pruning, manuring and hoeing of

COFFEE PLANTATIONS

in India, have never ceased to wonder at the generosity of the St. Helena tree, which often bears its white starry blossoms whilst the pickers are gathering the ripe fruit. There is much land now devoted to pasturage which would yield a better return under coffee cultivation, but there is the drawback of scarce and dear labour; however, this might be overcome. I have shown that the tree does not require so much attention as in India, and the picking can be done by girls at sixpence a day, supervised by women who get a shilling. Ordinary labourers' wages have now gone up from two shillings to half a crown a day, owing to military and other works in hand. I had an idea that tea would grow well, not so much for export as for island consumption. Some years ago, whilst inspecting the Lawrence Asylum at Ootacamund, I found that the boys were drinking tea which they had grown on the estate, and had made up at a neighbouring factory for a few annas a pound (I think two annas). I saw no reason why the poor of St. Helena should not be able to buy tea at sixpence a pound, grown in the island and made up at a small central factory.

THAT TEA WILL GROW

is proved by the existence of some China plants which were introduced in the time of the East India Company. In 1896 I tried the experiment, having taken out with me a native of India who had been for nine years an overseer on a tea estate in Assam. I got some tea seed and reared a number of plants, but in the meantime I had to return to England, and whilst there to recall my tea-planter, and on my return I found that the rabbits had devoured my young tea seedlings, and so ended an experiment, which cost me nearly a hundred pounds. But still I feel inclined to try again under my personal supervision. But whatever experiments are tried in the starting of any industry, they should be tried by those who will devote the whole of their time, labour, and money to it, as a tea or coffee planter does, when he goes out to India. Land is not dear here—the average price of estates lately sold has been from £10 to £15 per acre—but as the culturable area is limited, it does not often come into the market. As I said before, much valuble land is now kept solely for pasturage, which would, if highly cultivated with coffee, yield a much better return. That island coffee is now in demand is proved by the fact that, having sent away last month a barrel of coffee from the Government House plantation as a sample to Messrs. Lewis and Peat, coffee brokers, of Mincing Lane, with a view to ascertaining its quality, I discovered that I could not purchase any island coffee from other sources, as the whole stock had been bought up by the contractors for the troops, Messrs. Solomon and Co., who kindly let me have a little for my own consumption. It was only the other day I was pointing out to some friends, who had lately arrived, some coffee-trees on an estate, which had been allowed to run up from 12 to 15 feet in height; they looked the picture of health, and were bearing freely, but ought to have been pruned down at about 4 or 5 feet. In 1869 the Government attempted to introduce

CINCHONA,

but without much success. A nursery was farmed under the supervision of a skilled gardener sent out from Kew, who raised about 10,000 plants from seed, of which about one half were put out on the slopes of Diana's Peak; but the experiment was discontinued in 1870, by Admiral Patey, who came out as Governor with instructions to reduce expenditure, and in the retrenchments which ensued, the gardener from Kew was struck off. From that time the cinchona-trees were left to shift for themselves, and now there are probably not more than 150, some of them fine ones and fairly healthy. At the present time, the cultivation on such a limited scale as could be carried out here would not be commercially profitable, as the large cinchona plantations in India, Java, and other places have brought down the price of the bark. Still, the trial has shown the wonderful capabilities of this little island, where in an area of 47 square miles, plants from all parts of the globe have been grown with success; and one remarkable feature of this adaptability of soil and climate has been the struggle between the indigenous and the imported

FLORA,

which has resulted in the former being driven back to the central mountain range, the northern edge of the vast crater, which existed in the volcanic period, the southern portion of which is now under the sea. There you will still find the ferns of the place, from the stately tree-fern and the huge *Daplazium*, with its seven-feet fronds, down to the tiny filmy fern (*Hymenophyllum capillaceum*). Here too, the foliage strikes you as being of an old-world character. The trees have a weird, unfamiliar look, such as one would associate with the megatheriam and the mylodon. Sir Joseph Hooker, in his lecture on Insular Floras, refers to that of St. Helena as being "most interesting; it resembles none other in the peculiarity of its indigenous vegetation." In another part he says, speaking of the indigenous species: "Forty of them are absolutely confied to the island. These forty are absolutely peculiar to St. Helena, and, with scarcely an exception, cannot be regarded as very close specific allies of any other plants at all." It is to be regretted that some of the most interesting species have become extinct, among them the beautiful ebony-tree (*Melhania melanoxylon*), of which no traces remain, save a few crooked bits of wood, occasionally disinterred from the soil in places where it grew, and even these are becoming very scarce. Yet this was one of the most abundant trees, probably one of those which in Juan de Nova's time clad the rocks with verdure down to the cliffs overhanging the sea. It was so abundant that it was cut down to burn the lime used in the building of the fortifications. The destruction of the forests and extinction of many of the indigenous plants were due to the ravages made by goats, which in the sixteenth and seventeenth centuries existed in thousands, laying waste the country.

AN OLD ORANGE-TREE.

The oldest orange-tree in France has just died this is an item recently found in the "Press Miscellany." If true, it is interesting as showing the very great age to which an orange-tree may attain under favourable conditions. The details as published are as follow:—

It was brought to France with several others in 1421, by Queen Leonore of Castile, the wife of

Charles III. of Navarre, and in 1684 Louise XIV. ordered that it be transplanted to the orange grove in Versailles, and there it has remained ever since. During the last two centuries the tree has been known as the "Grand Bourbon," and for many years every possible care has been taken to preserve it from decay. Now it has passed away at the great age of 478 years, and many Parisians who knew it well are sorry that they will never again see this stately ornament of the Versailles Gardens.—*Queensland Agricultural Journal.*

STUDY THE TEA BUYER: BIG BREAKS WANTED.

(*To the Editor of the Home and Colonial Mail*)

Sir,—I wish to draw attention to what is becoming a very serious question for tea buyers in the London market, namely, the dividing up of a break of tea into three or four divisions and offering them all in the same week, or even on the same day. I have just been looking over this present week's catalogues and find from Salonah, three Pekoes, three Pekoe Souchongs; Dinjan, four Pekoes; Khobong, three Pekoes; Debrapar, four Pekoes and four Pekoe Souchongs; Sokerating, four Pekoes; Amo, three Pekoes No. 1 and 7 Pekoes No. 2; Carron, three Pekoes and three Pekoe Souchongs; Hapjan, three Pekoes; Greenwood, two Pekoes and three Pekoe Souchongs; Etah, two Pekoes No. 1, two Pekoes No. 2; and so on, if your space would admit of the needless multiplication of examples. Now all these gardens are presumably managed by good men of business, and yet here is plain evidence of defying the oft-expressed opinion of the market as set forth in the annual circulars of all the best informed brokers, who ever and anon have recommended the increasing the size of the breaks. Some of the breaks above referred to do not average more than twenty-four chests; the quality of each of the three or four twenty-four chest lots is so close that few experts would find ¼d per lb. between them; yet instead of bulking the three together so as to save time, buyers must taste three samples and microscopically endeavour to detect a shade of difference, thus wasting much valuable time and exasperating them besides. It is perhaps too much to hope that the pointing out of this flagrant condition of things will effect any alteration, nevertheless, in the best interests of the Indian tea industry, I think attention should be directed to it. When will sellers learn that in studying the buyer is the surest way to increase business, and in the long run get the best price? And when will they perceive the fact that the man who has accurately valued one sample will bid higher for it than the man who has hurriedly and uncertainly looked at four samples and cannot for the life of him make up his mind which is the best?—I am &c., D F Shillington.

THE INDIAN TEA ASSOCIATION (LONDON.)

The following is an abstract of the proceedings of a meeting of the general committee held on Tuesday, 9th Jan. Present: Mr. D Cruickshank, Messrs. Robert Lyell, F A Roberts, A G Stanton, (chairman), J N Stuart, W H Verner, C W Wallace, and S A Went.

The Late General Henry Hopkinson, C S I.—The following resolution was unanimously passed by the committee before proceeding to the business of the day: "This Association regrets to learn the decease of General Henry Hopkinson, C S I, who was for many years associated with the Indian Tea Association as its chairman, and begs to express its sympathy with his family."

The minutes of the last meeting of the committee, held on Tuesday, December 19, 1899, were read by the secretary and confirmed

Correspondence with Calcutta, which had been previously circulated to members, was laid upon the table.

Scientific Officer for the Tea Districts.—A letter on this subject from Dr. Voelcker, addressed to Mr. Cruickshank, was read by the secretary, and at the request of the committee Mr. Cruickshank arranged to see Dr. Voelcker again and settle with him as to the engagement of a suitable man with the requisite qualifications to proceed to India and take up the appointment.

Warehouse Charges.—Mr. Geo. W Christison's letter of October 27th last was considered and discussed by the committee, and also the minutes of the meeting of the Calcutta committee of December 5th, 1899.

Travancore Statistics.—After some discussion it was decided that in future it was advisable that estimates of the Travancore crop should, if procurable, be given separately by the Calcutta Association when framing their forecast of the Indian tea crop.

Work in America.—The secretary reported interview with Mr. Mackenzie on 8th inst. Letter from Mr. Mackenzie dated 8th idem was read, and secretary was instructed to reply confirming arrangements made.

1lb Draft.—Correspondenee with Mr. J A Brown, Secretary Tea Buyers' Association, was read by the Secretary, and meeting of Joint Committee arranged for Thursday, 11th instant, at Ceylon office.

Paris Exhibition, 1900.—It was noted that four photos of Darjeeling had been received from this exhibition from the Calcutta Association. The photos were exhibited to the committee.

Proposed Dock Trust for the Port of London.—Letter from Mr J A Brown, Secretary Tea Buyers' Association, was read, intimating that Mr. John Lacky had been appointed as their representative for the special committee of the London Chamber of Commerce. Mr F A Roberts was requested, and agreed, to act as the representative of the Indian Tea Association. Ernest Tye, Secretary.

—*Home and Colonial Mail*, Jan. 12.

Sugar.—*Capital*, writing on the sugar-cane crop in Bengal, says:—The season was rather favourable to the crop at the beginning, but subsequently heavy rain adversely affected its prospects, and in some places the crop suffered from want of rain and damage by insects. The total area under sugar-cane is returned at 860,200 acres, against 861,100 acres in the previous year. Only three districts report a crop which is above the normal, and nine districts an average one; the remaining thirty-three districts expect an outturn below the normal. The forecast of the crop was a normal outturn, but it is now probably that only 84 per cent of a normal crop will be obtained. On this basis the outturn of raw sugar may be expected to be 15,896,500 cwt. against 17,428,700 cwt. in the previous year.

ON THE DETERMINATION OF THE FUNGI WHICH ATTACK FOREST TREES IN INDIA.

The study of the fungi which are found in the forests of India, either as parasites on the leaves or as causing decay of the wood, or again as saprophytic plants on the ground in the forests, is one which so far has made but little progress. Most forest officers, however, know how exceedingly important the subject is, and many of them have had opportunities of seeing what has been done in Europe to work it up, and most especially in Germany. The real pioneer in the study of forest-tree pathology was undoubtedly Prof. Robert Hartig of Munich, whose text book of the "Diseases of Trees," which is available to English students in the excellent translation of Dr. W Somerville, revised and edited by Prof. Marshall Ward, F R S (Macmillian & Co. 1894) is one of the most intersting works which a forest officer who observes the processes which are going on in the forests, inimical to forest tree-growth and development, can study. There is an excellent, if somewhat brief, account of the principal European tree fungoid diseases, by Mr. W R Fisher, in the 4th Volume of Dr. Schlich's Manual of Forestry, and another in Prof. Marshall Ward's 'Timber and some of its diseases' (Macmillan & Co. 1889). But the most important and most astonishing book on the subject is the monumental work of Dr. Karl Freiherr von Tubeuf, which has been translated into English by Dr. W G Smith of Edinburgh as 'Diseases of Plants, induced by Cryptogamic Parasites' (Longmans, Green & Co. 1897) a work which is practically a dictionary of all that is known on the subject and refers not merely to European plants, but to the plants of the world and those

OF THEIR FUNGOID DISEASES

which have been so far discovered. A mere cursory examination of Dr. von Tubeuf's great work is sufficient to open the eyes of even the most conservative and sceptical of Foresters to the importance of the subject and to the amount of information which still remains to be obtained regarding it. It is clear that there is hardly a plant among the higher order that is not affected by some, indeed often by many, parasitic and epiphytic fungi; and the wonder is that with so many foes, plants cultivated and wild and forest trees are able to maintain successfully their powers of growth and reproduction. So far as they were known at the time he wrote, Dr von Tubeuf made mention of the Indian species.

It is fortunate that, so far as observations have yet gone, the chief forest trees of the hotter parts of India have not been found to be affected by injurious fungi to the same extent as are the forest trees of Europe and their allies of the Himalaya, but in the Himalaya the fungi are often very much in evidence and even in the plains there are some of considerable importance, a few examples of which may be given.

In January 1891, I visited the

CHANGA MANGA PLANTATION

with the Forest School students who were on tour there under the supervision of the Deputy Director, Mr. Fernandez. Not far from the Forest and Canal Bungalows, in a low-lying rather damp area, many dead and dying trees were met with. On being cut into, the stems of these trees were found to be permeated in every direction by the white mycelium of a fungus. At first, we thought that possibly the fungus might be one of those species which attack only dead wood, but the presence of the mycelium in still living trees was against this, and after a considerable search, the sporophores of a large species were found, with every indication that they belonged to the mycelium in the wood. The sporophores consisted of a large, dark, red-brown, bracket, fixed to the tree at one side close to the root; the upper surface measured perhaps a foot to a foot-and-a-half in length and 6 inches or more in breadth, and showed several rings indicating its gradual growth. The spores were in tubes on the under surface in the manner characteristic of the *Polyporeæ*, and the fungus, on being sent to Kew for identification, proved to be a new species and was described by Mr. G Massee as *Polystictus egregius*. By some authors *Polystictus* is regarded as a section of *Polyporus*, that large genus of Hymenomycetous fungi which possesses so many members destructive to forest trees and timber in Europe, among which perhaps the most noticeable is *P. sulphureus*, which has sporophores very closely resembling those of the Changa Manga plant. Again, when on tour in 1889 in the Casuarina plantations of Nellore in the Madras Presidency, a similar case of dying and dead trees was observed, and the only specimen (a very young and imperfect one) which was obtained of the sporophore, was found to be very similar to the Changa Manga one and may very likely have belonged to the same species. In both cases, I remember to have very strongly urged the local officers to follow up the subject, and specially to study means for getting rid of the pest, but I have never since heard if anything store was done, and fear that *Polystictus egregius* is mill at work trying to ruin the beautiful plantations of Sissoo in the Punjab, and the Casuarina groves of the Madras coast. Of other *Polypori* the most noticeable perhaps is *Polyporus (Fomes) fomentarius*, which is everywhere conspicuous in the North-west Himalaya especially on the 'ban' oak *(Quercus incana)* and the birch *(Betula alnoides)*, the sporophores consisting of a huge, hard, grey, reversed bracket. This fungus, which thrives both on living and on dead trees, perhaps more frequently on the latter, is also common in Europe, where up to quite recently, and indeed still to some extent, the dried sporophores are used for tinder. Many of us can still remember the 'amadou' matches which used to be sold in the cities of Europe for lighting cigars, and which were made of the dried felt of the sporophores of this species.

For many years, the parties who have visited the

DEODAR FORESTS OF JAUNSAR

yearly for the instruction of the students of the Forest School, have been interested and puzzled by the groups of young dead deodar to be met with here and there, the cause of death being not at once apparent. Often have we dug up specimens, only to find what might have been expected, that the roots and the lower parts of the stems were fully permeated by the mycelium of some fungus, *but what kind of plant it was and what could be done to stop if we had no means of telling*. Last autumn, however, (1898), spring searchings having invariably failed, I was in Jaunsar and took every opportunity of hunting for the sporophores and at last was successful in finding a rather poor specimen which was unmistakeably the cause of the death of a fine young deodar near the Jako pass. It was sent to Kew and proved to be *Polyporus (Fomes) annosus*, Fries, better known by the older name of *Trametes radiciperda*, Hartig, and described by Hartig as "undoubtedly the most dangerous of all the parasites met with in coniferous woods, not only because it produces the worst kind of red-rot, but also on account of its being the most common cause of gaps in both young and old plantations." It is impossible to exaggerate the importance of this sad discovery. The Forest Department is very properly yearly spending on the reproduction of deodar large sums of money and so far the success has on the whole been considerable, better perhaps with natural than with artificial reproduction but still good in both cases. In Jaunsar and in the neighbouring leased forests of Tehri-Garhwal, the disease is, so far as my own observation goes, on the increase, and it is now time to take strong measures to stop it before it goes too far. It is propagated, as is well known and as is described by all the writers on the subject, Hartig, Marshall Ward, Fisher, von Tubeuf, chiefly by the contact, in the soil, of the roots of adjoining trees and the remedy proposed, and for long adopted in Germany, is to isolate affected trees or patches of trees by digging trenches around them sufficiently deep to prevent their roots passing beyond and communicating

he disease to neighbouring trees. Further details must, of course, be worked out on the spot, but I strongly advise early action or the spread of the enemy may be too quick and we may lose some of our finest and most promising areas of reproduction.

These few examples ought to show sufficiently clearly how very important the subject is, and if we are to utilize to the full the information obtained in, and the experience of, Europe, we must begin by searching for and finding the sporophores and obtaining their identification. The identity of the fungus which attacks the stems of the Kharshu *(Quercus semicarpifolia)* trees at Deoban in Jaunsar, requires to be investigated. From the fact that it is apparent both in the mycelial form of white threads disintegrating the wood, and in the form of long black stout rhizomorphs it is most probably the well-known *Agaricus melleus* or an allied species, but the discovery of the sporophores is necessary in order to settle the question.

In the case of Hymenomycetous fungi like those already mentioned, it is not always easy to find the sporophore and identify the enemy; but in other cases, and especially in the case of

THE LEAF-DISEASES,

it is not so difficult. Most of those who have worked in the sub-Himalayan sal forests have noticed that in some years the leaves of the trees, often over considerable areas, appear as if covered with soot. A very little examination of the effected leaves shows that the black appearance is due to a fungus, but although the spores of the fungus were readily found, its nature remained for some time in doubt. Specimens collected by myself in Dehra Dun and by Pandit Keshavanand in the forests of Oudh were sent to Dr. D D Cunningham, F.A.S., of Calcutta, and his report was that the blight was a Meliolaceous Pyrenomycete ......not parasitic but merely epiphytic and that where they do any injury to the host, it is purely due to their interfering with assimilation and respiration from the dense surface-coating which they ultimately tend to form." A note on the subject appeared in the "Indian Forester" Vol. XX, p. 156 and further specimens were sent to Kew where they were identified as *Meliola amphitricha*, Fries. Thus two investigations were satisfactory and showed that after all, unless the fungus was very bad indeed, it was not to be expected that it would cause greater injury to the sal forests than a slight retardation of growth. So is it also, generally, with the well-known conspicuous orange-coloured uredineous fungi which occur on the leaves of Himalayan conifers and which were the chief subject of the paper in the "Indian Forester," Vol. XXI, p. 126, by Mr. J. Nisbet, with pictures from photographs taken by Mr. C G Rogers. The chief of these was the yellow tassel-like fungus on the young leaves of *Picea Morinda* called by Mr. Nisbet *Æcidium Thompsoni* and identified at Kew as *Peridermium incarcerans*, Cke. and by Barclay as *P. piceæ* Barcl. This bright-looking fungus is, as Mr. Nisbet pointed out, closely allied to the *P. coruscans*, Fries, which attacks the spruce tree of Europe and is occasionally eaten by the peasants in the north, and I believe it is itself occasionally used as an article of food in the Himalaya. The damage done by it is not very great unless it happens to attack the principal leading shoot of the tree. Then there were also the Peridermia of the pines, *Pinus longifolia*, and *P. excelsa*, identified at Kew as *Peridermium orientale*, Cke. These appear as small orange-coloured sacs of spores on the needles of the trees here and there, but do little harm unless they occur, as Mr. Nisbet points out, on the branches in the form of the var. *corticola*. They have been described, in more detail, in Mr. Nisbet's paper already referred to, as well as in Dr. Cooke's paper in the "Indian Forester." Vol. III, p. 88. The *Peridermium pini* of Europe, which is found on the Scots pine, is known to be in its leaf-attacking variety the æcidial form of *Coleosporium senecionis*, a fungus which attacks the groundsel, but the corresponding alternate plant of the *P. orientale* has not yet been discovered and here there is some scope for the investigator. As regards the alternate from of the var. *corticola*, Hartig says.—' It is to be regretted that so far the plants have not been ' determined on which the teleutospores are produced. Until we discover the teleuto form, preventive measures must be confined to felling pines that are attacked." Dr. Barclay thought that the forms on *Pinus longifolia* and *Pinus excelsa* were distinct, and named them, respectively, *Æcidium complanatum*, Barcl. and *Æ. brevius*, Barcl. (see Jour. As. Soc. Beng. lix. ii. 101-102). He thought at one time, that the latter might possibly be the æcidial form of *Chrysomyxa himalayensis*, a bright orange-coloured fungus very common on the petioles of the leaves of Rhododendron trees in the hill forests, but afterwards changed his mind and considered that the alternate host of the latter would more probably be *Picea Morinda* and the fungus *Æcidium piceæ* (see Scientific Memoir of Medical Officers of the Army of India, Part VI, 1891, p. 71.)

An interesting example of alternate generations in fungi is given by Dr. Barclay in the same Scientific Memoir, Part V 1890, p. 71, where he shows that the *Gymnosporangium Cunninghamianum* which grows on *Cypressus torulosa*, Don, has its æcidial form on the wild pear *Pyrus Pashia*. The cypress fungus is that one which may be seen in abundance about Bodyar in Jaunsar, having, in wet weather, the form of gelatinous yellow masses. Nisbet in the 'Indian Forester,' XXI, 132, speaks of these as a *Nostoc* or *alga*, but this is not mentioned by Barclay.

Another example, perhaps the best known example, is that of the,

'RUSTS' OF WHEAT,

and other cereal crops and grasses. A very full account of these rusts was published in 1897 by Dr. Prain of the Royal Botanic Gardens, Calcutta, in 'Agricultural Ledger' No. 16 in which he explains how, among others, the 'Black rust' (*Puccinia graminis*) which attacks wheat, oats, barley and rye, as well as other grasses, has its æcidial stage on species of barberry (*Berberis*); the 'Brown rust' (*P. dispersa*) which attacks wheat and rye and other grasses has its æcidial stage in various species of the 'Borage' family; and the 'Crown rust' (*P. coronata*) which attacks chiefly oats and other grasses has its æcidial stage on various Buckthorns (*Rhamnus Berchemia*, etc). Dr. Prain explains how it is not yet known exactly whether the common rusts of India have their æcidial stages on other plants, and if so, what plants these are, but we *do* know that æcidia of a fungus which has at Kew been identified as *Puccinia graminis* has been found on *Berberis aristata*, that *Puccinia coronata* has been identified as attacking *Rhamnus purpureus* and *virgatus* and that a fungus described by Mr. Barclay as *Uredo ehretiæ* has been found in the Himalaya attacking the Boraginous tree *Ehretia serrata*, and may be possibly identical with *Puccinia dispersa*; so that there is every reason to think that, at any rate in the neighbourhood of the north-west Himalaya the principal rusts of the cereal crops are traceable to the leaf-fungi of Himalayan forest trees and shrubs.

The pages of the 'Indian Forester' contain several articles of interest on the subject of Indian parasitic fungi, and more especially can we draw attention to Dr. M. C. Cooke's admirable papers in Vol. II. p. 380, and Vol. III. p. 14. Dr. Cooke was also good enough to name for me some specimens collected by myself and others, and these are mentioned in Vol. IV. page 90 and page 197.

The chief workers in the field of the Indian fungoid diseases of plants have been Dr. D. D. Cunningham, F. R. S., who has lately retired from service in broken health after many years of hard work in Calcutta; and Dr. A. Barclay who died in 1891 at Simla of typhoid fever at the early age of 39, to the great regret of his many friends and correspondents, and to the great loss of Indian scientific work. A notice about him and his work will be found in the "Indian Forester," Vol. XVII. page 303.

It may be well here to mention,

A FEW OF THE SPECIES,

which attack forest trees, which were described by Dr. Barclay, chiefly in the Journal of the Bengal Asiatic Society.

1 on *Berberis aristata* the rust *Puccinia graminis* Pers.

2 on *Hypericum cernuum* the yellow *Melamspora Sanctis Johannis*, Barcl.

3 on *Rhamnus daharicus* the rust *Puccinia coronata*, Corda.

4 on *Vitis himalayana Uredo cronartiiformis*, Barcl.

5 on *Acacia eburnea Æcidium esculentum* Barclay. The attacked twigs are eaten in the Poona District, as reported by Mr. R. C. Wroughton—see Pro. Bomb. Nat. Hist. Sec., Vol. 2.

6 on *Rosa macrophylla* *Puccinia Rosæ*, Barcl.

7 on do *moschata* *Phragmihium subcorticium*, Schrad.

8 on *Rubus lasiocarpus* *Phragmigium Rubi*, Pers.

9 on do *biflorus* do *quinqueloculare*, Barcl.

10 on *Rubus paniculatus* do *incompletum*, Barcl.

11 on *Pyrus varioloso* *Gymnosporangium clavariæforme*, Jacq.
the alternate form of this probably comes on Juniper.

12 on *Pyrus Pashia* *Gymnosporangium Cunninghamianum*, Barc
alternate form on cypress, see above.

13 on *Cotoneaster bacillaris* *Gymnoporangium Cunninghamianum*.

14 on *Astilbe rivularis* *Xenodochus Clarkianus*. Barcl.
very common—spores bright yellow on the leaves,

15 on *Deutzia corymbosa* *Uredo Deutziæ*, Barcl.

16 on *Rhododendon arboreum* *Chrysomyxa himalayensis*, Barcl.

17 on do *lepidotum* *Uredo* sp.

18 on do *campanulatum* *Æcidium* sp.

It is supposed that these latter may all be connected in some way, but the question still requires solution. But it seems more probable that the first has its alternate stage on *Picea Morinda*.

19 on *Jasminum humile* *Æcidium Jasmini*, Barcl.

20 on do *grandiflorum* *Uromyces Cunninghamianus*, Barcl.

21 on *Ichnocarpus frutescens* *Uredo ichnocarpi*, Barcl.

22 on *Ehretia serrata* *Uredo ehretiae*, Barcl.
On this see also "Indian Forester" XVIII. 21 and above.

23 on *Colebrookia oppositifolia* *Uredo Colebrookiæ*, Barcl.

24 on *Ficus Palmata* *Æcidium Mori*, Barcl.

25 on *Morus serrata* *Cœoma Mori*, Barcl.

26 on *Populus ciliata* *Melampsora ciliata*, Barcl.
This is a light yellow fungus found on the leaves, the white one which makes the leaves look as if powdered with lime being *Uncinula salicis*

27 on *Populus alba* *Melampsora æcidioides*, Barcl.

28 on *Pinus longifolia* *Æcidium complanatum*, Barcl.

29 on *Pinus excelsa* *Æcidium brevius*, Barcl.
Both these species are now united as *Æcidium orientale* as already described.

30 on *Picea Morinda* *Æcidium Thompsoni*, Barcl.

31 on do *Æcidium piceæ*, Barcl.
on these, see previous remarks.

32 on *Cedrus Deodara* *Æcidium Cedri*, Barcl.
This forms small yellow spots, and the leaves turn yellow, bend down and fall of, but the damage done is not great.

Since Dr. Barclay's work, little or no original work has been done in India on the fungi which attack forest trees, but many specimens have been collected and send to Kew for naming and the first instalment of these was published in the Kew Bulletin for June 1898. The chief of these which are parasitic on forest trees are :—(1) *Gamblcola cornuta*, Massee, which occurs as black tufts on the leaves of *Berberis nepalensis* and is very common about Chakrata, and (2) *Melampsora epitea* Thüm, which is found as yellow masses on the under surface of leaves of *Salix elegans*. Others have also been named and will doubtless appear described in future numbers of the Bulletin; among them may be mentioned: *Exobasidium cinnamomi* Massee, the remarkable growth on the branchlets of *Cinnamomum Tamala* referred to in Mr. Nisbet's paper ("Indian Forester," Vol. XXI. p. 133) as *Exoascus* and producing a large bushy kind of witches' broom, seriously deforming the branches of the trees. It was found near Thadyar in the Tons valley, (2) *Stereum lobatum*, Kunze, a large hard fungus found on oaks (*Quercus dilatata*) in Jaunsar; (3) *Rosellinia spadicea*, Cesati, a black fungus found on the lower part of the old culms of *Arundinaria spathiflora*; and (4) *Trichosporium aterrimum*, Massee, a curious black species which apparently does considerable damage to mulberry trees in Changa Manga. It was discovered by Mr. F. Gleadow.

Besides the parasitic species, there are many interesting.

FUNGI ATTACKING DEAD WOOD.

One of the most noticeable of these is the scarlet *Polystictus sanguineus*, Fries, so common in the sâl-forests; the prettily-shaded *Polystictus versicolor*, Fries, is also abundant in sâl forests on dead bark; *Hymenochate Mongeotii*, Cooke, is a dard red fungus, occurring in large patches on the outer bark of *Betula alnoides* in the Himalaya *Lentinus omphalomorphus*, Mont and *Dædalea Schomburgckii*, Berk. are white fungi conspicuous on sâl logs. *Hydnum Gleadovii*, Massee, is a beautiful sponge-like fungus of similar situations.

It has only been possible to mention a few of the many kinds which have been discovered of recent years. Specimens of most of them are deposited in the Museum and Herbarium at Dehra Dun, but there is much more yet to be done, and the chief object of this paper is to urge Forest Officers to collect specimens and send them for identification through the Director of the Forest School, where duplicates should always be kept, allowing the originals to be retained at Kew. I feel sure that the Director of Kew will be very glad to assist in obtaining names, and that Mr. G. Massee will be delighted to continue to publish such new species as he may find among the collections sent. The information obtained cannot fail to have an important bearing on forest management especially on that of the forests of conifers of the N.-W. Himalaya, and by degrees materials can thus be collected towards a Handbook such as it is obviously desirable that we should possess. Leaf fungi can be collected and dried like ordinary Herbarium specimens, larger species can be merely dried loose and packed in paper. It is of the utmost importance to give full information and notes, and above all, to give the name of the plant upon which the fungus is found.

—*Indian Forester* J. S. GAMBLE.

TEA CULTURE AND MANUFACTURE.—Mr. Kelway Bamber has been giving good advice and some useful practical hints to his neighbours in Dikoya and Bogawantalawa, which, as embodied in two Sub-Committee's Reports, will be found given on page 550. What is stated about all planters simultaneously dealing with grey blight, burning and burying prunings, plucking off diseased leaves from the next flush, &c., reads rather like "a counsel of perfection," and yet there can be no question that the nearer it is approached in practice, the better it will be for that particular district. As to manuring, manufacture and shade trees, Mr. Bamber is very much to the point; but in recommending a leguminous catch crop to dig in, we fear he is going beyond what is practicable in Ceylon, save in a few special cases,

A VISIT TO PERADENIYA GARDENS, CEYLON.

(By a Newcomer.)

At the entrance to the Gardens the drive on the left is bounded by a wall of rich, green foliage studded with large mauve flowers. This is the Burmese creeper, *Thunbergia laurifolia*, which hangs from the tall tree tops in massive sheets, a sight which strikes the newcomer from temperate climes where creepers are not nearly so luxuriant.

Driving round to the right, the visitor comes to the great "banyan tree," which from age and size is a worthy landmark in this garden of about 150 acres. Near by is another tree, *Brownia grandiceps*, of smaller dimension, with very handsome large red flowers, each flower-head being composed of a great many flowers and when fully open is as large as a plate.

Behind this, there is in course of construction a Merophyte House, in which a new system of glazing designed by the Curator is to be tried. Here will be accommodated the numerous cacts which are always fascinating on account of their bizarre appearance, and which resent the moist tropical climate of Ceylon. I was shown here some flowering plants which have retained through their evolution a close resemblance to ferns in the leaves so much so that even botanists may at first readily believe them to be ferns.

In the pond in front of the banyan tree, some odd examples of the adaptability of plants are seen. Thriving equally with plants of a true aquatic nature, are plants which in their native habitat are only found in dry rocky places, such as species of the pine-apple family. Here also is the *Cyprus papyrus*, of which the ancient Egyptians made their papyrus parchment by slitting the stem which is of a pithy texture, into thin slices. These they laid overlapping each other, smeared with the sticky clay of the Nile, and then pressed with great weights for a long time till they offered an even surface on which to write. Close by is a very interesting looking tree (*Pandanus larum*) with a smooth even circular stem for about ten feet. At that height it divides into three diverging branches, each again dividing exactly into three before the nine crowns of leaves are reached. At the base, to complete the extraordinary appearance of this tree the aerial roots seem to tumble out of the stem about four feet from the ground, quite thick, smooth and perfectly cylindrical. This is the "bread-fruit tree" of the Nicobar Island.

In another part of the Garden it was interesting to find numerous experimental plots of economic plants, which, however, are necessarily small in extent. It seems a pity that there should not be some larger area devoted to such a purpose close to the Gardens and under the supervision of the Director.

Incidentally as regards the complaint made by a recent correspondent in the *Observer*, about the labels, I can vouch for the system of labelling the plants here now being very satisfactory, and considering its difficulties in a tropical climate, reflects credit on those responsible for it.

The Curator has lately devised labels of a material and caste different to those hitherto in use, and, being now employed for over a year, there can be no question as to their utility, both as regards legibility and lasting qualities.

In walking over these extensive grounds, with entrancing (?) views of towering peaks in the neighbourhood, majestic avenues of palms, gigantic bamboos gracefully arching over the "Great Sandy River" (Mahaweliganga), which nearly surrounds the Garden, and trees and flowers galore to admire—one can understand why this is so often considered "the finest garden in the world." The views from both the memorials erected to Drs. Gardner and Thwaites are particularly charming, and especially so as they can be admired whilst one sits in the cool and shade of these welcome retreats. The thought naturally occurs "Where is the Trimen Monument?" Alas! there is none. But a more lasting monument than a structure of wood, stone and mortar is left by Dr. Trimen himself in his works, which, I suppose, are too advanced and scientific to require a public acknowledgment similar to that which has been afforded to the less important labours of his predecessors.

The palm avenues and giant-bamboos always strike the stranger as perhaps the chief feature of the Gardens. Possibly the handsomest of the former is the talipot avenue planted in 1881 by Dr. Trimen. A new avenue of cabbage palm (*Oreodoxa regia*) has been planted lately, which in time will have a magnificent effect—Nature's Corinthian pillars—as one is pleased to think of them—which are built of a grey stone, but not with a plumb line swelling here or there as they will and ending at the top in a frieze(?) of green leaves and supporting the vaulting of the sky.

I have no doubt numerous other trees *et hoc genus omne* are worth mentioning; but time and space forbid. One of special interest, and especially at this moment, is the wonderful cannon-ball tree, which at present bears a number of large dark-brown globular fruits extremely suggestive of their popular name. As my guide suggested, the use of these might well be considered in such emergencies as are sometimes experienced in warfare. Let the Contingent, when they get to Pretoria, remember this as a useful solution of that last nut which the authorities have to crack, viz. the fate (or head) of Kruger.

Lastly let me mention four enormous Rain Trees (*Pithecolobium saman*) of South America, which were pointed out to me as the parents of all the trees of that species in the island. They are grand old progenitors with their mighty limbs and an appearance which bespeaks age and venerableness.

In conclusion let me say how well the Gardens are maintained and gradually improving as far as the votes for them allow; and how well they repay the visitor, especially if he go early or late, when the temperature and his temper are cool.

LARGE TREES.

The largest tree in the world is to be seen at Mascali, near the foot of Mount Etna, and it is called "the Chestnut-tree of a Hundred Horses." Its name rose from the report that Queen Jane of Aragon, with her principal nobility, took refuge from a violent storm under its branches. The trunk is 204 feet in circumference. The largest tree in the United States, it is said, stands near Bear Creek, on the north fork of the Tule River, in California. It measures 140 feet in circumference. The giant redwood-tree in Nevada is 119 feet in circumference.—*Ladies' Home Journal.*

CEYLON TEA MARKET REVIEW FOR 1889.

Messrs. Stenning, Inskipp and Co., in their annual report, says :—

THE COURSE OF THE MARKET.—The market opened with prices about on a par with those ruling at the close of the year, but as the month advanced quotations began to stiffen, common grades realising 6¼d to 6½d ; during February and March these grades went dearer. very little selling under 7d per lb. A further improvement took place during April, but a giving way was noticeable towards the end of the month. In May and June the demand was strong, but the quality generally being indifferent, common sorts market rather easier prices. During July the market was disorganised in consequence of the draft dispute, and very little tea was offered. In August sales were heavy owing to accumulations, and a lower range of prices ruled, common Pekoe Souchong selling at 5¾d ; fine invoices, however, realised full value. During September the demand improved, and, the quantity brought forward being moderate, prices began to harden. Very little common leaf was to be had under 6½d. From October to the end of the year prices were steady, except for medium Broken Pekoes, which showed some irregularity. All good liquoring invoices brought full value. The year closed with a brisk demand.

QUALITY on the whole has been fairly up to average ; some of the high grown teas have had distinctive character and realised satisfactory prices, and we are glad to note that the quantity of undesirable tea has not been so large as in former years. Teas with flavour always command attention, but when this cannot be obtained, a deep coloured liquor should be aimed at, as pale liquoring teas without flavour meet with but little inquiry

SMALL BREAKS.—The limit remains the same as before, viz, anything under 18 chests, 24 half-chests and 40 boxes. The large number of small breaks offering in auction every week is not only a source of trouble to all branches of the trade, but it is hardly possible for the buyers to give them proper attention ; business would be greatly facilitated if larger lots especially of the lower grades, could be sent forward.

FOREIGN TRADE.—It is satisfactory to note that the export from this country continues to increase.

OTHER MARKETS :—

The New Regulations regarding the weighing of tea, which were to have come into force on October 2nd last, but are still in abeyance, are as follows :—

1 If the package weighs the even pound, it is to be entered as such.

2 If it weighs the even half-pound or over, it is to be entered as the next pound above.

3. If it weighs below the half-pound, it is to be entered as the pound below.

LOSS IN WEIGHT.—As this occasionally gives rise to much dissatisfaction we offer the following suggestions : That the gross weight of the package should be a few ounces, say four or five, above an even number of pounds, and that the empty package, complete with lead, nails, bands, &c., be to a like extent below an even number of pounds. In weighing here the gross weight is reduced to the even number of pounds, whilst the tare is increased to an even number of pounds,

With regard to garden bulked teas, it is imperatively necessary to put an equal quantity into each package of the break, and this quantity should be four or five ounces over the desired weight of contents, viz., if the packages are invoiced to contain 100lb tea each, not less than 100lb 4oz should be weighed in ; test packages, weighing here a fraction under 100lb, are reckoned as 99lb only, or a loss of 1lb on each chest of the break.

Careful observance of the foregoing precautions will prevent loss and disappointment.

DRAFT of 1lb per package on all packages grossing 29lb and upwards is allowed to the buyer.

WEIGHT OF PACKAGES.—When a gross weight of 129lb is exceed, there is an additional charge of 5d per package up to 159lb. The following scale of charges fully explains this and deserves attention :—

Dock and Warehouse management rates, subject to an uniform discount of 10 per cent., on packages grossing as under are :—

160 to 199 lb. 2s 9d ; 130 to 159 lb. 2s 3d ; 90 to 129 lb. 1s 10d ; 80 to 89 lb. 1s 8d ; 60 to 79 lb. 1s 5d ; 45 to 59 lb. 1s 2d ; 35 to 44 lb. 1s ; 17 to 34 lb. 7d.

MARKS ON CHEST.—Nothing is wanted or is of any service here beyond (1st) garden mark ; (2) description of tea ; (3) garden numbers. Gross tare, and net are not of the least use, and should be discontinued.

METAL AND VENESTA PACKAGES.—There is practically no objection to these.

PACKING SMALL BROKENS AND DUSTS.—Special care should be taken to pack broken descriptions, which are so liable to lose in weight, in strongly made wooden packages. Dust should be placed in half chests, either of metal or of strong iron-hooped packages. Canvas coverings should in no case be used, as they disguise injury done to the packages by rough handling, and any tea retained in the canvas becomes of no value.

[Particulars are also given of the imports, deliveriess, and stocks of the past six years ; home consumption of India, Ceylon, and China teas for the past fifteen years ; the number of packages from the various districts sold on garden account since 1893, and the average prices ; Calcutta and London markets from May to December.]—*Home and Colonial Mail.* Jan. 12.

A NEW GERM-DESTROYER.—A new germicide has been discovered. Ozone when passed into water is found to kill the micro-organisms. This discovery has been made in Lille, where the water is notoriously bad, by two French gentlemen. They are taking steps to purify the water-supply of that town. Ozone is another form of oxygen which is common in the air after an electrical discharge of lightning and it is manufactured by a current of electricity being passed through air. It has been already found that heat alone up to the boiling point has not been an efficient germ-destroyer, so that this discovery will be welcomed by the medical profession. The boon to the traveller in France, who has no taste occasionally for wines or who may be a teetotaller, will be great. This discovery besides is one step nearer to that landmark of civilisation to which Pasteur called attention. "The first step is civilisation man made when he drove the wild animals from his cities, the next will be when he has banished all germs."—*Cor.*

TEA IN RUSSIA.

A large Moscow firm erected a large factory on its plantations last year, and the authorities on the estate belonging to the Imperial Domains at Chakva have followed this example, and have this year set up a tea-making establishment of considerable dimensions. The yield of the tea crop has been good and, comparatively speaking, fairly abundant. The flavour and quality of the tea does not, however, compare favourably with Chinese, Indian and Ceylon qualities, and the prices at which the small quantities obtained are being sold do not suggest that, for the present at anyrate, any alarm should be felt by the tea-growers of the East in respect to the competition which Russian grown tea is likely to afford in the markets of the Empire.—*British Consul in Caucasia.*

SUGAR CROPS OF THE WORLD.

Though for easily comprehended reasons a statement in figures of the cane sugar crop of 1899/1900 at the present moment cannot be an exact one, still for the sake of clearness we give below a compilation of the momentary, but still uncertain export estimates of the new crop for the period between September 1st, and August 31st, in the principal cane districts.

	1899/00. tons.	1898/99. tons.	1897/98. tons.
Cuba ..	300,000	315,175	199,700
Portorico ..	50,000	55,295	51,022
Trinidad ..	50,000	48,757	48,717
Barbados ..	50,000	50,872	46,960
Martinique ..	30,000	30,411	30,669
Guadeloupe ..	36,000	39,254	37,128
Demerara ..	85,000	92,940	107,362
Brazil ..	180,000	145,000	170,000
Java ..	650,000	888,605	637,141
Philippine I. ..	125,000	124,456	176,184
Mauritius ..	150,000	180,062	1 7,350
Reunion ..	39,000	39,485	35,239
Jamaica ..	30,000	30,000	35,000
Minor Antilles ..	85,000	80,000	95,000
U. States ..	370,000	275,000	358,150
Peru ..	130,000	125,000	105,463
Egypt ..	90,000	90,822	80,178
Sandwich I. ..	250,000	240,000	229,414
Total..	2,700,000	2,851,134	2,560,677

"In the some way, though they cannot be taken as final estimates either, we give the following figures of the European beet sugar production, comparing them with the preceeding campaigns as follows:—

	1899-00.	1898-99.	1897-98.	1896-97.
Germany	1,800,000	1,721,718	1,852,857	1,836,536
Austria	1,070,000	1,051,290	831,667	934,007
France	915,000	830,132	821,235	752,081
Russia	870,000	790,000	738,715	728,667
Belgium	250,000	235,000	265,397	288,009
Holland	175,000	149,763	125,658	174,206
Other countries	220,000	170,000	196,245	202,990
Total	5,300,000	4,947,903	4,831,774	4,916,586

"Thus the campaign of 1899/00 is now giving prospects of a surplus of about 352,000 tons, against the predecessor; but we remark again that exact figures for 1899/1900 cannot yet be given."—*Mr. F. O. Licht of Magdeburg.*

THE JAMAICA-ENGLAND FRUIT TRADE.

Sir Augustus Hemming, Governor of the Island of Jamaica, has made his annual report to the Colonial Office, and from it we gather the not pleasant news that there is still a deficit of general revenue amounting to over £153,000. Referring to this fact a correspondent writes:

The fruit trade with England does not so far appear to have made much progress, notwithstanding the subsidy to a fast steamboat service, of which we heard last year It is very questionable whether such a policy will be advantageous to growers, as the distance is much greater and the freights so much higher than to the United States. The price which the American will give for his tropical fruits would never suit the English consumer. Consequently we are cut out by our American cousins in this particular trade. Fruit coming from the Mediterranean, Spain, the Western Isles, and the Canaries also enters into competition with West Indian produce, against which the latter will certainly not be able to compete under existing prices and freights. From a knowledge of the island it seems incomprehensible to me how this subsidy could ever have been granted, as the people of the island do not believe in any fruit trade with the home country being a success, and the people at Pudding-lane and Covent Garden will advise anyone inquiring not to embark in such an enterprise.

"Perhaps," the correspondent adds, "the Colonial Secretary thinks he knows better, but time will tell."—*Westminster Gazette*, Jan. 8.

PLANTING NOTES:

RUBBER CULTIVATION IN SOUTHERN INDIA is the subject of a long article in the *Madras Mail*, which we reproduce on page 553. It does not contain much that is new to us in Ceylon, but it is well to note how far our neighbours have got on, or are prepared to go, with a new product.

PADDY IN BURMA.—The estimated area under paddy cultivation in the fourteen principal rice-growing Districts of Burma is reported to be 6,055,937 acres, being an increase of 44,264 acres over the area reported last month. It is now estimated that there will be available for export 2,020,881 tons of cargo rice, equivalent to 34,252,220 cwt. of cleaned rice.—*Madras Mail.*

CACAO CULTURE.—We do not know that the planter who writes on this subject (see page 548) carries us much further in information than did Mr. Carruther's final Report, a copy of which (through the *Tropical Agriculturist* or otherwise) is no doubt handy for reference with each cacao planter in the country. Still, there are certain items of experience narrated which are worth noticing and which may lead to further interesting correspondence.

COAL IN SIKKIM.—Mr W P Mason of Darjeeling has been fortunate enough to discover coal in Sikkim in apparently large quantities and of good quality. The Political Officer of Sikkim, Mr. J Claud White, has had 20 maunds extracted and sent away to be analysed. Should the coal be of good quality, in an easily accessible spot, and in workable quantities it will prove of the greatest benefit to the station of Darjeeling and to the neighbouring tea planters. Firewood is already dear in Darjeeling, and as the forests are getting out down more and more every year, the advent of call to take the place of wood will be most advantageous.—*Englishman.*

Correspondence.

To the Editor.

THE COCOA MARKET.

(*Special report.*)

London, E.C., Dec. 29th, 1899.

DEAR SIR,—This being Christmas week, and the end of the year and no business having been transacted down Mincing Lane, the usual Tea and other Circulars have not been issued. The next Cocoa sale will take place on Tuesday, 9th January, when it is hoped and expected that the Government will be buyers, if sufficient cocoa suitable for their requirements is offered.

Although nothing has been done with cocoa in London, the market is very strong, and prices are looked upon as being higher all round. The Liverpool market, which is almost entirely confined to Africans, is very firm, 36 bags having been sold this week at 63s. The present stock of cocoa in Liverpool on the 23rd December was 4,265 bags of all growths against 1,766 bags in 1898. On the same date the stock of Ceylon cocoa in London was 5,708 bags, and of all growths 83,641 bags, or 11,713 bags less than the same time last year when it was 95,354 bags.—The continental markets are very firm.—Yours very truly, HAROLD HAMEL SMITH,

THE WEST INDIES AND COCOA.

London, Jan. 5.

DEAR SIR,—It will be interesting to watch the results of the appointment of Mr. Sydney Olivier, C.M.G., as Colonial Secretary of Jamaica, for as the author of the essay on "The moral aspect of the basis of Socialism" published by the Fabian Society in 1890, he may perhaps instil some new ideas into the monotony of Colonial official ways. The essay is divided into three parts, (a) the evolution of morality, (b) property and morals, (c) the Re-integration of Society; and is provisionally described as an attempt to justify socialist ideals by the appeal to canons of moral judgment accepted generally, and supported by the results of positive ethical science. Mr. Olivier, who is a B.A. of Oxford, is best known as having been the Secretary to the West Indian Commission for 1896.

This has virtually been a holiday week for Cocoa, though several lots have changed hands privately, and the demand is very strong. It is not yet definitely known whether the Government will be in the market next week. So far as I can find out about 600 bags of Ceylon will be offered, and it is expected, will bring good prices, as the trade are bidding 60s for common stuff for which they would not give 58s for last sale. The stock of Ceylon on 30th December was 6,924 bags of which about 8 to 900 bags are available for offering. Today's quotation for dull to good red is 69s to 80s, fine bold has sold to 87s, but there is none offering now. Cadbury's are offering 65 tons of their cocoa butter for sale next Tuesday (9th)

Although 495 500 quintals of cocoa was received at Guayaquil during 1899, against 420,000 qts. in 1898, and the receipts of African at Lisbon were 223,000 bags against 166,000 bags last year, the stock of all growths in London is some 16,000 bags less than at the end of 1898, being (in round figures) 82,000 bags against 98,000 in 1898. The stock at Havre is 100,593 bags, against 72,101 bags in 1898, but in October the Havre stock was 140,000 bags, so it has considerably diminished in the last two months.

My correspondent in Trinidad writes me as follows :—"Last mail I calculated that the cocoa crop next year would be 25 per cent short, I see now the members of the Legislative Council have refused to sanction next year's estimate on the grounds that the cocoa crop will be 30 per cent. short, as estimated by experts. The drought has been something awful, the peasants will have a hard time of it next year, for their ground provisions (vegetables) started in September, got no rain and suffered terribly."—Yours truly,

HAROLD HAMELSMITH.

THE LONDON COCOA MARKET.

SIR,—According to Mr. Ed. Kynaston's West Indian Circular, the following are the cocoa statistics of London for the past four years ;—

	1899 bags	1898 bags	1897 bags	1896 bags
Imports	202,000	236,000	198,000	204,000
Home consumption	143,000	169,000	146,000	133,000
Stock	82,000	98,000	93,000	140,000

"The apparent falling-off in Home Consumption in London is misleading, and is attributable to the increasing imports of Bahias, and Africans which pass direct to our large provincial manufacturers--chiefly through Liverpool." The deliveries of Liverpool were 90,067 bags in 1899, against 31,446 bags in 1898 and 16,380 bags in 1897 : this would make the combined total deliveries, for Home Consumption, of London and Liverpool to be 233,000 bags in 1899, against 201,000 bags in 1898, and 163,000 bags in 1897 which confirms what Mr. Kynaston says :

The sale last Tuesday went off with good competition especially for fine Ceylon which was 5s to 7s dearer, some Warriapola mark selling at 95s 6d, against a previous record of 87s 6d last month—and present prices show Ceylons to be worth 63s for mixed native, good red 75s, fine red 88s to 95s 6d. The sales include 125 bags Yattewatte at 85s 6d, 28 bags Asgeria 82s, 10 bags Allagala A1 76s, 16 bags Bandarapola at 79s 6d, 13 bags New Peradeniya 1 at 83s, 80 bags North Matale at 90s, 90 bags Warriapola at 88s and 89s and 45 bags of the same mark at 95s 6d cwt.

Generally speaking all cocoa was up 2s 6d to 3s. Trinidads selling up to 82s 6d, Grenadas to 72s 6d, Dominicas to 70s 6d. For the time of year the sale was a very small one, only 3,200 bags being offered against 11,849 bags on 10th January last year. Since the sale the firmness and high rates have been maintained, anything approaching good red in Trinidad fetching 1879 and 1880. With Ceylons all the fine red has been sold, but prices for lower grades, although not in such active demand as the finer qualities, are very firm.

About 25 tons cocoa shells were offered and sold at slightly easier rates. Cocoa butter of which 65 tons was offered and sold, also went about 1d a lb. easier, selling at 1s 5d to 1s 6¼d per lb., or on an average of 1s 5 9-16d against 1s 6⅝d in December. The average price of this article at the Dutch sales, which took place on the same day (9th) was 1s 5¼d lb.

The stock of cocoa of all growths is nearly 20,000 bags less than in 1899, being 80,256 bags, against 100,270 bags in 1899. The stock of Ceylon and Java on 6th January was 6,770 bags.

Per sample post I send you samples of San Pedro D'Abadie 119 bags Trinidad cocoa imported May 1898. L. R. C. 94 bags imported March 1898. [These can be seen at our office. —Ed. *T.A.*]

The L R C mark sold after the sale at 79/ and the San Pedro are held for 80/. These cocoas have thus been here nearly tw oyears, and I send them to show how well good strong cocoa will keep, when well cured and prepared. Last year it seems was a very trying one with the three months bout of tropical heat that we had.

I also send an article on "cocoa" I am publishing this week in the "Confectioner's Union," the trade Journal of chocolate makers and confectioners.

HAROLD HAMEL SMITH.
London, E. C. Jan. 12th.

ON CACAO—AND THE DISEASE.

Jan. 25

Sir,—As there has been so much written lately in the columns of the daily papers, on subjects that are scarcely of any value to planters, such as "Do Teal settle on Trees," &c., I think it strange that more important subjects, such as the *cacao disease*, was left severely alone. During the time Mr. Carruthers was with us, we heard pretty often, but lately there has been absolute silence. It is because we are all so busy fighting the disease that we have no time to argue, or what? I for one am working hard to eradicate the disease which has affected my charge, and would be glad to hear what my fellow-planters have to say on the subject. It would do us all and the country at large a vast amount of good, to thus ventilate the subject through the medium of the press, who I have no doubt would help us to the last.

Some cacao estate superintendents are shaving off the diseased parts and cutting into the wood, till the black threads are taken out, and then left bare; others apply coal tar, margosa oil, lime, carbolic mixtures, &c., both on the diseased part, and on the shaved part. And again some places (which I think is the wisest plan) are cutting *all* trees in the least affected, right out, level with the ground, and burning them immediately. The disease seems to be very infectious, for I find it nearly always bad near pits where the cacao husk has been buried, although they have been well dusted with lime before being covered with earth.

Trees should be examined, round the stem first, for if the disease has affected the bark *right round*, there is no use, *I say*, of letting that tree remain. Whereas if you were to shave *all* the *diseased* part off seeing that the tree looks healthy (like some are doing), in the hope that it will recover, I am *quite* certain their hopes will never be realised. I say this from some experience, in marking the trees so treated, for I nearly always found that they were quite dead within four to six weeks from the time they were last seen to. The above is only a means of further spreading the disease. Some planters are trying the latter course and I am sure it is only penny-wise but pound-foolish; in trying to save a few trees they are only giving it time to spread much worse. There is no doubt about it, that many of our best tea aresste suffering very severely from the disease, although we hear so little about it I know of one place where 250 acres of cacao have been quite wiped out. And from our experience we now know that it affects only the red variety; and on very rare occasions does it affect the Forastero. You can see trees side by side, yet the red is diseased badly, and the Forastero looking quite healthy.

A few years ago, some of our *best* cacao men went in for only the red variety, and would not hear of having the Forastero, the argument being that the red-fetched better prices. They never, for one moment, thought of the hardiness of the growth and other prospects at the time. I fancy they are pretty sick now that they ever planted it.

For obvious reasons. it would not do for me to sign my name, but I enclose my card. I would be glad of correspondence from men similarly placed, as it would be of the utmost value to have such an important subject, at the present moment, discussed. —Yours, etc., CACAO PLANTER.

The Prospects of Tea Planters.—Says the *Investors' Guardian*, Jan. 6: When the sun rose on January 1st, 1899, he found the Indian tea trade in an unhappy condition, 1898 had closed with little or no business being done in shares, and prices were sympathetically low. In the early part of 1899, however, it was widely believed that the crop would prove short of the demand, and, in consequence, the prices of common teas rose sharply, with a corresponding effect upon the value of shares. But these favourable reports had a somewhat unsubstantial foundation; the results were certainly not very much behind those of 1897-8, even in Cachar and Sylhet concerns, whose very poor results were barely compensated for by the strictest economy and cessation of all attempts at development. A few companies were as successful in 1898-9 as in 1897-8, but for the majority the former was the worse year, and, as a result, share-values drooped from the middle of the year, with few transactions. In the late autumn when the market in tea was fairly brisk, and when the output in Cachar and Sylhet recovered considerably, the market revived somewhat. Such being the condition of affairs, it is not surprising that no new companies were floated during the year. There have, however, been a few additions to the capital of old companies. In the home trade the year has been a notable one on account of the attempts which were made to abolish the pound draft and to reform the system of weighing. Harmony has now been restored, and no harm will come to the ventilation of these vexed questions. The teas of India and Ceylon continue to open up for themselves markets all over the world. It is slow work, necessarily, but even the continent of Europe is now showing unmistakable signs of yielding to the fascination of "the cup that cheers," and especially is this the case in Russia. In fact, only the other day, a meeting was held in Colombo, at the instance of Russian tea buyers, to consider the development of the Colombo market, where Russian firms found it difficult to obtain as much tea as they required. There is no need for planters to despair; far from it. Tea shares do not lend themselvef to speculation just now, it is true, but the industry is a sound one, and for investment as opposed to speculation, is worthy of consideration.

TO ALL PARTS OF ASIA, AFRICA, AMERICA AND OCEANIA.

Seeds & Plants of Commercial Products.

Castilloa Elastica Cervantes.—Orders being booked for the coming crop of seeds available in March and April, selected seed from very old trees. R. N. Lyne, Esq., Director of Agriculture, Zanzibar, writes under date 24th August, 1899:—"Please send me 200 seeds of Castilloa Elastica for further trial; the seeds of Castilloa you sent me last August germinated very well." Price and particulars in our Circular No. 32; special quotations for large orders according to quantity; immediate booking necessary to avoid disappointment.

Hybridised Maragogipe Coffee.—A larged-beaned superior variety of Coffee in demand; orders booked for the coming crop of seeds, February and March delivery. Price accord ng to quantity on application.

Hevea Brasiliensis (Para Rubber).—Orders being booked for the coming crop available in August and September, 1900. This is the only crop of seeds in the year. All orders should reach us before the end of July to avoid disappointment, as we have to make arrangements in time; guaranteed to arrive in good order at destination. We have already booked a large number of orders. A Sumatra Planter writes, dating 9th March, 1899:—"I consent to the price of £———per thousand. I herewith order 50,000 upon condition that you guarantee at least 33 % seeds germinating." Plants can be forwarded all the year round in Wardian cases. Price and particulars as per our Circular No. 30. A Borneo planter writes dating, Sandakan, 17th August, 1899:—"The last lot of Para seeds turned out very well."

Ficus Elastica (Assam and Java Rubber.)—Seeds supplied by the pound with instructions; price according to quantity. This tree grows equally well in high and low land, in forest and grass land, its cultivation being extended largely by the Indian Government. For price of seeds with particulars as per our Circular No. 33.

Manihot Glaziovii (Ceara or Manicoba Rubber).—Fresh seeds available all the year round; price as per our Circular No. 31. It is superior to Mangabeira rubber and second to Para rubber.

Urceola Esculenta (Burma Rubber) and **Landolphia Kirkii** (Mozambique Rubber).—Seeds and plants, both are creepers.

Cinchona Seeds.—Different varieties.

Sterculia Acuminata.—(Kolanut). Superior quality, seeds and plants; price on application, packed to stand the transit well for several months, a hardy tree, cultivation easy.

Erythrina Lithosperma.—Thornless variety, new crops of seeds ready in December, May and June. Price according to quantity on application.

Seeds and Plants of Cinnamon, Nutmeg, Clove, Sandlewood, Pepper, Cardamom, Vanilla, Arabian, Liberian and Maragogipe Coffee, Cacao, Tea, Coca, Fibre, Medicinal and Fruit Trees. Shade and Timber Trees, Eucalyptus various varieties, also Palms, Bulbs, Orchids, &c.

Our enlarged Descriptive Price List of Tropical Seeds and Plants of Commercial Products for Foreign Countries for 1899-1900 are now being forwarded to applicants in different parts of the world. Also Descriptive Price Lists of Seeds and Plants of Fruit Trees, Bulbs, Tubers and Yams, and Orchids.

"SOUTH AFRICA."—The great authority on South African affairs of 25th March, 1899, says:—"An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants, of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Brothers."

A leading Planter writes from *New Hebrides* under date 17th January, 1899:—"I shall like a few more of your Catalogues to distribute through these Islands, as I feel sure many would place themselves in communication with you, did they know where to write for Seeds and Plants."

Our New Descriptive Price Lists of Seeds of Shade Trees for Coffee, Cacao, Tea, Cardamoms, &c., Timber Trees, Trees for Avenues, Hedges Wind and Shelter Belts, Ornamental Trees, Shrubs and Climbing Plants; and Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons and Dracinas, now being prepared and will be ready shortly.

Agents in London:—MESSRS. P. W. WOOLLEY & Co., 33, Basinghall Street.

Agent in Colombo, Ceylon:—E. B. CREASY, Esq.

Telegraphic Address:
WILLIAM, VEYANGODA, CEYLON.
Lieber's, A.I. and A.B.C. Codes used.

J. P. WILLIAM & BROTHERS,
Tropical Seed Merchants,
HENARATGODA, CEYLON.

TEA CULTIVATION: MANURING, &c.

DIKOYA PLANTERS' ASSOCIATION AND MR. KELWAY BAMBER.

REPORT OF THE BOGAWANTALAWA SUB-COMMITTEE APPOINTED TO MEET MR. KELWAY BAMBER.

Mr. Bamber has been up to Campion twice; on the second occasion, 22nd July, 1899, he was met by the Sub-Committee. Those present were Messrs. A. C. Bonner, Fred. Hadden, W. P. Barber, and H. B. Roberts. In the morning Mr. Bamber went down early to the Factory and took one or two notes of Temperature, Moisture in the air, etc. At 9 a.m. Mr. Bamber went out to the field beiug manured with the mixture advised by him. During the walk he was able to give some useful hints on blights, manuring, etc., and amongst other things that quick lime dusted over the bushes after pruning, not only kills all moss and lichen, but is likewise beneficial to the tea in many ways, as nearly all Ceylon soils are deficient in lime, but this must be applied while the bushes are moist from either rain or dew. Fresh wood ashes used in tho same way are also very good for the above purpose.

Manuring.—Mr. Bamber pointed out that he thought manure such as the mixture now being applied on Campion, was better forked iu round the trees, than put into semi-circular holes, except on steep land where holes might be necessary.

Forcing Manures.—With a view to getting a largely increased yield, beyond what the soil is capable of doing, he thinks somewhat dangerous.

Blights.—These Mr. Bamber considers are much on the increase, and in some districts are gettiug serious, especially grey blight, and that where this is the case, it is advisable to burn the prunings green if possible, and also to sweep up and burn all leaves on tho ground. Also when the tea comes into leaf again, as soon as any blight appears, the diseased leaves should be pulled off and burnt, and that this should be done not by *one* estate but by *all*. Unless prunings are universally burut and done thoroughly, burning is useless.

Burying Prunings.—Prunings if buried should be limed at the same time and then covered with soil, and this although not destroying the blight *in toto*, would certainly destroy a large proportion. Grey blight is easily identified by the black specks on the diseased part. Mr. Bamber looks upon grey blight as the most serious we have and considers it should be taken in hand at once by all estates.

Grevilleas he thinks beneficial rather than otherwise to tea. Mr. Bamber believes that some leguminous crop might be found which would be beneficial, if grown between the rows of trees to be fterwards buried green.

Manufacture.—In the afternoon Mr. Bamber made analyses of the leaf in different stages of manufacture and found that the pungency and strength lost in he process of manufacturing was less than on most estates. This shows that longer fermentation at a low temperature can be done without losing these qualities, and therefore with advantage to the teas.—(Sigd.) A. C. Bonner, Fred. Hadden, A. L. Hine-Haycock, Hugh B. Roberts, William P. Barber.

REPORT OF THE DIKOYA SUB-COMMITTEE APPOINTED TO CONFER WITH MR. KELWAY BAMBER.

Mr. Bamber has several times visited Darrawella Estate. On the last occasion, 3rd August, 1899, he was met by the Sub-Committee, those present being Messrs. H. B. Roberts, Keith Rollo, F. G. A. Lane, W. R. Tatham, R. H. Eliot, J. Anderson, and W. P. Barber.

Manuring.—The Sub-Committee learu from Mr. Bamber that the main object should be to apply such manures as will keep the bushes in health and maintain the yield, and he would deprecate forcing manures being used so as to ensure an increase of yield only. Manuring judiciously done after analyses of soils, would lead to the liberating of plant food at present in the soil which now lies insoluble. Mr Bamber recommends manuring being done immediately, before or after pruning, and being forked in wherever practicable.

Manufacture.—The analyses of teas in this and higher districts point to the fact that the best and most valuable qualities in the tea, are maintained by keeping a temperature as much below 75 as possible in manufacture up to the time of firing. Mr. Bamber suggests more care should be taken to prevent the made tea absorbing moiture when lying in the Factory, as this would assist in maintaiuing the keeping qualities of the tea.

Shade Trees.—In reply to enquiries as to shade trees, Mr. Bamber recommends Grevilleas, Albizzias, and Dadaps planted at distances which would not make the shade too dense, and stated that the beneficial effects of these trees were:—

(1) To encourage the tea roots to feed lower.
(2) To bring up plant food to the surface.
(3) To save wash.
(4) To equalise the temperature of the soil.
(5) To tend to help the rain water to filter through the soil aud draw air to the lower depths.

Also he recommends the growth of a leguminous plant such as "Crotolaria Striata," and cutting down and digging it in at the time of flowering. This plant grows wild in Paddy fields in Badulla and elsewhere at 2,000 to 3,000 feet elevation.

Tea Blights.—The Sub-Committee desires to urge most strongly on all members to burn or bury prunings with lime so as to minimise the adverse influences of these pests, which they believe tend to largely reduce yields, and they understand from Mr Bamber that when burying purnings they should be covered with 7 to 9 inches of soil and lime or basic slag sprinkled over the prunings before covering, the quantity being 4 to 5 cwt, per acre. When burning prunings the ashes should be sprinkled over the pruned trees.

(Sid) Hugh B. Roberts, W. R. Tatham, K. Rollo, R. H. Eliot, F. G. A. Lane, J. Anderson, Willam P. Barber.

COCHIN MARKET REPORT.

Cochin, January 27.

C. N. Oil.—With an improved demand in the market mainly for prompt deliveries, prices made a slight advance, and contracts were placed at R87 per candy.

Coir Yarn.—Further contracts are reported at late prices. Regular shipments are going forward to Europe both by direct boats and via Bombay mainly against orders on c. i. f. terms.

Rope Yarn.—Ditto.

Coprah.—Rassi R52–53 per candy.—*Cochin Argus.*

Rubber Estates of Para, Limited.—The estates, consist of 284 square miles.—*India-Rubber and Gutta-Percha Trades Journal,* Jan. 8.

Rubber.—A recent issue of the Hongkong *Telegraph* has this note: "The Goa papers announce that Captain Moraes has discovered a plant in the wilds of the Portuguese territory of Goa, a tree which yields India-rubber in considerable quantities. The tree is described as Randalfia, and it is stated that the Portuguese authorities are about to encourage its cultivation on a large scale."—*India Rubber World,* Jan. 1.

SISAL GRASS IN MEXICO.

Henequen, or sisal grass, has been in use among the inhabitants of Yucatan from the earliest times. The United States Consul at Progreso says that he has found it imbedded in the form of cord in the stucco figures that ornamented the façades of the mysterious ruined cities of Yucatan. There are two wild varieties of henequen called by the natives "cahum" and "chelem." The fibre of these wild plants is used to some extent by the natives in the making of cordage for domestic use, and some claim that hammocks made from the fibre of the cahum are the best. It is, however, the cultivated plant that furnishes commerce with the fibre known as sisal grass, Sisal being the old port from which the fibre was first exported. Like the wild plant, the cultivated one is divided into two varieties—the "zacci," or white hemp, and the "yaxci," or green hemp. The zacci is considered the finest and best, but the yaxci is a good fibre. It has been generally supposed that sisal grass, as an article of commerce, has been known only within the last fifty years, but this is a mistake. Between the years 1750-1780 quite a furore was created in commercial countries of the Old World by the discovery that the fibre of a plant found in Yucatan was good for ship's cordage. Spain sent over a Royal Commission to report upon the discovery, and in a few years many of Spain's commercial and war vessels were using cordage made from henequen. For some reason, probably because of the primitive method of preparing it, the use of silk fibre gradually declined, until at the commencement of this century the former trade had been forgotten. In 1847, Yucatan, until then a cattle-producing, cotton-growing, and logwood-exporting country, was in the throes of an Indian war. The Maya Indians had risen in rebellion, and had succeeded in driving the white race out of the most fertile portions of the peninsula, forcing them to rely for means of subsistence upon the products of a sterile rocky belt; too poor to sustain cattle in any numbers.

HENEQUEN.

was the only useful plant that would grow on such a soil. The first plantation was established in 1848, and the 50 acres planted were cleared by the use of the tonka, the primitive cleaner used by the native Maya. There was a good demand for the new fibre in ship rigging, and it gradually came into general use, until sisal grass was a well-known article of commerce. The tonka was a piece of hard wood, shaped something like a handsaw, having the end curved in. The leaf of the henequen was drawn through the sharp curve, and the fibre was stripped of the thick, pulpy covering. The leaf was subjected to this operation two or three times, until the fibre was left clean and free. This tedious process was not long tolerated. A machine was found to increase the output, but the demand again outgrew the supply. The machine known as the "Raspador," or the "Soles," from its inventor, came into use, and has held its own almost up to the present day. It consists of a large-toothed wheel, that scrapes the pulp and leaves the fibre. Its simplicity made it peculiarly fitted for use by the native servants. Plantations came to be known as plantations of one, two, or a dozen wheels. The constantly increasing trade necessitated still more rapid means of fibre cleaning. Many new machines were produced, each of which was said by its inventor to be far better than any of the others. The exportation of sisal grass during the ten years ended December 31st, 1898, amounted to 585,000,000 tons. It has been said that the best fibre-producing plant grows on the poorest and most rocky soil, but this does not accord with experiments recently made. One method of planting and cultivating is as follows :—The field is first carefully prepared and burnt. The burning produces a certain amount of ashes, and many planters set out seed corn at the same time they plant the henequen. The one does not interfere with the other in the least, and the corn crop helps to pay the cost of the henequen. The henequen plant is propagated not by seeds, but by scions, or suckers. The plant produces seeds, and in a natural state propagates itself by both seeds and scions, but the planter uses only suckers from 18 to 20 inches high. By this method he can produce a field of henequen redy to cut within five years, whereas by seed planting he would have to wait from eight to nine years. Once planted and properly tended—that is, cleared of weeds twice a year, and not under or overcut—a field will last twenty years, and instances are not wanting of fields that have lasted longer. A leaf is ready to cut when it extends at right angles to the trunk or the plant. A healthy vigorous plant in the maturity of its growth should yield from 18 to 24 leaves. One thousand leaves should produce from 50 lb. to 60 lb. of good, clean fibre. This amount is fair average. When the plants in an old field send up a flower-stalk, it is nature's signal that the crop is finished. The old plants must then be clipped of all useful leaves and cut down, to allow the young scions (which should have been already planted between the old plants) ventilation for growth. Bad cleaning, allowing rot to be produced by the acids nascent in the plant pulp, and dampness, produce red and mould-stained fibre, of less than one-half the value of the good, clean, white fibre. This is rarely exported, but is sold at home for domestic use. There are in Yucatan nearly 1,200 henequen-producing plantations of various sizes. The largest plantation, or, rather, the plantation producing the largest output, is on the line of the broad gauge railway between Merida and Progress. It is called Ticilchè, and produces about 1,000 bales, or 375,000 lb. of cleaned fibre per month.—*Journal of the Society of Arts.*

KEROSENE FOR SAN JOSE SCALE.

Some months ago a correspondent reported that, as a last hope, he had painted with kerosene direct from the tin some young trees badly infested with San Josè scale. He had evidently got the idea of this treatment from an articlo which appeared in the *Agricultural Gazette* for May, 1898. When the paragraph about the success of his experiment appeared in the *Gazette* there was much comment, but according to Bulletin 138, New Jersey Agricultural Experiment Station, Professor J. B. Smith (whose article was printed in the *Gazette*, May 1898) has during the past two years treated nearly 4,000 trees of all the ordinary orchard fruits, except cherries, with crude petroleum, either undiluted or mixed with from 60 to 75 per cent of water. The trees operated upon varied from stock just out of the nursery row to old trees in full bearing.

"Not a single case of injury to any tree treated in winter has been observed; on the contrary, in a number of cases the oil seems to have acted as a stimulant, and the sprayed trees have shown greater vigour and better foliage than those untreated. In no case has there been any injury to fruit buds, but on this point the observations are incomplete, no early winter treatments having been made in bearing orchards. Applications made after January 15th (midwinter) have in no way lessened the crop of apples and pears the year following, and applications mado in March have not injured the fruit buds in peach and plum (July and September here). Crude petroleum is not suited for a summer application, either pure or diluted, because of its choking effect on foliage and its persistence. This, however, increases its value for winter work as compared with kerosene; the latter acts at once or not at all and evaporates very soon after it has been applied—in fact, to avoid injury, it must be applied in such a way as to favour rapid evaporation. Crude oil does not evaporate readily; it is penetrating, and, if applied with a brush half-way-round a branch, will often soak round the branch completely; it remains as an oily or greasy surface coating for many weeks, and no scales can set on this coating within a month of the application and live; it does not ordinarily penetrate through even the surface layer of bark; under the most unfavourable circumstances, if the outer layer is penetrated, the inner layer remains healthy and

there is no progressive injury ; it does not seem to interfere with bark functions, and young trees painted with the oil increased in size quite as rapidly and freely as those untreated. Crude petroleum will kill the pernicious scale in winter whenever it comes into sufficient contact with the insect. It is a contact insecticide, and will not injure what it does not touch; but, liberally applied, it will soak thorough masses of scale no matter how densely set, as nothing else will, A minor advantage is the fact that it gives a greasy brown colour to the bark, making it easy to see exactly how thorough the application has been."

It is scarcely likely that the indiscriminate use of either crude or refined petroleum will ever be recommended, but in a young orchard a little might be applied with a brush the moment a scale is discovered. —From the *Agicultural Gazette* of New South Wales for January.

VOGAN TEA COMPANY.

DIRECTORS' REPORT.

The Directors have pleasure in submitting their report and accounts for the year ended 31st Dec., 1899, which they trust will be considered satisfactory by the shareholders.

The total crop secured for the year was as follows :—

Vogan ..	263,241 lb.	as against	227,848 lb.	in 1898
Iddagodde...	123,368 lb.	do	125,989 lb.	do
Bought Leaf	2,528 lb.	do	30,929 lb.	do
Stamford Hill and Barkindale ..	95,286 lb.	do	100,712 lb.	do
	484,423 lb.		485,478 lb.	

On actual estate account Vogan and Iddagodde have given 8,241 lb. and 3,368 lb. respectively over estimate, whilst Stamford Hill and Barkindale shew a shortfall of 4,714 lb.

The yields per acre have been as follows :-

Vogan (old tea) 611 lb. (including 78 acres young tea). 561 lb. Iddagodde old tea ,617 lb.

Total yield old and young tea, 580 lb. per acre, Barkindale and Stamford Hill (old tea) 433 lb. per acre.

The following usual table shewing the cost and average of the Company's tea in Colombo (including bought leaf) for the past two years, will be found interesting :—

Estate.	Cost 1898.	Or without Manure	Cost 1899.	Or without Manure	Nett Average 1898.	Nett Average 1899.
	Cts.	Cts.	Cts	Cts.	Cts.	Cts.
Vogan and Iddagodde	20·22	19·21	20·15	18·83	34·00	36·81
Barkindale and Stamford Hill	25·58	22·60	22·17	20·90	43 90	45·30

It must be borne in mind that the profit on manufacturing outside leaf has been deducted from the expenditure when calculating the cost of Barkindale and Stamford Hill estate teas.

Now that the young clearings on Vogan and Iddagodde estate are beginning to come into bearing, increased withering accommodation is required, and it has been decided to put up Messrs. Davidson & Co.'s patent air fans with air tight chambers at a cost of R3,000 to 4,000 instead of erecting another withering shed at an enhanced cost.

The amount spent on plumbago prospecting, namely R4,785·01, has been passed to suspense account pending the result obtained from the leasing of the Company's Mining rights to a Syndicate, in connection with which mining operations are expected to be commenced shortly, on the arrival of Machinery from England.

After paying interest on debentures, viz.: R6,195, the amount at credit of profit and loss is R76,088·41, which is equal to 10·56 per cent on the capital of the Company as against 8·40 per cent last year. Of this amount R10 500 has been applied in redeeming and cancelling 21 debentures, a further 5,000 will be required to redeem 10 more debentures contracted for, and R200 has been absorbed in paying part of the Vogan Assistant Superintendent's passage to England. The Directors recommend that the available balance, namely R60,388·41, be apportioned as follows :—

	R c.
By the payment of a dividend of 7 per cent for the year ..	50,400 00
By the payment of a bonus to the Vogan Superintendent ..	1,000 00
By placing to Depreciation Account	5,975 01
By placing to Debenture Redemption Fund	2,500 00
By carrying forward to the next account	513 40
	R60,388 41

The acreage of the Company' properties is as follows :—

VOGAN AND IDDAGODDE.	A.	R.	P.
Tea in full bearing ...	590	3	23
Tea in partial bearing ..	78	2	30
Tea not in bearing ..	119	0	10
Stamford Hill and Barkindale	220	0	0
Total in Tea Acres ..	1,008	2	23
Vogan and Iddagodde Jungle, &c.	540	2	10
Total acreage ...	1,549	0	33

Owing to a considerable portion of the jungle having been felled for firewood it has been decided to plant up 25 acres of tea in the coming season, and to follow a similar course each year, when the result of the previous season's working warrant the outlay.

In terms of the articles of Association, Mr. W B Kingsbury retires from the Board of Directors, but, being eligible, offers himself for re-election.

The Auditor, Mr. J D Forbes, also offers his services for 1900.

INDIAN COAL.

AT a time when anxiety is felt about the output of coal in the United Kingdom, through labour troubles and the enlistment of all classes of work-people for Military needs in the homeland and in South Africa, it is cheering to read of the advance which the coal trade is making in India. The Report of the Directors of the East Indian Railway for the half-year ended the 30th June last, makes us acquainted with the fact that coal contributed largely to the success of the concern, which yielded the comfortable return of 6½ per cent for the year The amount of coal despatched from the collieries upcountry amounted to 95,000 tons, while there was exported from Calcutta by sea to Bombay, Karachi, Colombo and other ports, during the six months, more than in any previous corresponding period. For Bombay and Karachi alone as much as 200,000 tons were shipped. Here is, then, another instance of how the great Dependency of India is helpful to the Mother Country, while becoming its rival in trade in some respects.

LIBERIAN-ARABIAN HYBRID COFFEE.—The seeds received from Mr H B Winterbotham, of Meppadi, Wynaad, have germinated successfully, and will be planted out in the Gardens in a suitable place when large enough.—*Agri Horticultural Society of Madras.*

INDIGO: A THREATENED INDUSTRY.

The kind of help which the Government might well be asked to give to indigo growers, must here be made. The real merits of the dye produced from the plant must first be set forth and made known to the public, and the following extracts from a little pamphlet bearing the name of Fox Brothers and Co. (Limited) will suffice to do all that is necessary in this connexion.

"The superiority of pure indigo over other dyes may be briefly summed up as follows :—

"1. Fastness of the dye.—Indigotin, the colouring principle of indigo, is insoluble in water, alcohol, ether, and dilute acids and alkalies, either hot or cold, hence its extreme fastness for all conditions of ordinary wear and tear. It is also quite fast to sunlight, and for an all-round dye there is nothing superior to it at present. There is no need to point out the advantage there is in a perfectly fast dye as compared with one which may be fast to light, but will not stand perspiration or washing, or *vice versa*.

"2. Strength and handle.—Cloth dyed pure indigo is stronger and tougher than the same cloth dyed in other ways, owing to the dye-bath being at a comparatively low temperature and the absence of any injurious chemicals or mordants. In almost all other dyes the cloth is first boiled in mordant and then in the dye, for some hours altogether; this always impoverishes the wool fibre and destroys much of its natural lustre and softness. whereas the indigo vat with its soft mellow liquor adds to the fulness and richness of the fabric. Indigo dyeing being a mechanical process rather than a chemical one actually feeds the cloth.

"Pure indigo tests.—There are so many ways of producing a blue very similar to pure indigo that it is of the first importance to make quite sure that what is called 'pure indigo' is pure indigo and nothing else. The following simple tests will give a fairly good indication whether the dye is a pure indigo or not. In carrying them out, the tests should always be compared with similar tests on a known pure dyed fabric of like quality :—

"Nitric acid test.—Put two or three drops of ordinary commercial nitric acid on the same spot of the fabric. A yellow spot with a green rim quickly appears if the dye is pure indigo.

"Sulphuric" acid and water.—Make a mixture (about half a pint) of sulphuric acid and water, and in it boil quickly for ten minutes a small piece of the cloth to be tested, say 1 1-2in. square. The acid and water must be in the proportion of one part acid to nine parts water, and care must be taken to always gently pour the acid into the water and not the water into the acid. If the cloth which has been boiled is pure indigo, the solution will remain colourless.

"Soda and water.—Dissolve about 1 oz. of common washing soda in half a pint of water, and gently boil in it for 15 minutes a small piece of the cloth about 1 1-2 in. square. If the dye is pure indigo the liquid will remain colourless.

"In conclusion.—Our motive for placing this,

LITTLE SKETCH OF PURE INDIGO DYEING,

before the public is that from long experiences and countless experiments extending over many years we believe that there is nodye in the world equal to pure indigo, and our own experience is corroborated by evidence from all parts of the world. The one important point we wish to impress upon the public is that when ordering 'pure indigo' they must be sure that they get it as an immense amount of so called pure indigo is annually placed on the market, and the term 'indigo' or, trade indigo is often applied to absolutely worthless dyes. To assist the public we have included the foregoing few simple tests, any two of which taken together, are sufficient proof as to the genuineness of the dye.

Seeing that there is no blue dye in the world equal to natural indigo, and that immense quantities of substitutes are used and sold under more or less the same name, it appears to be necessary, in the interests of (*a*) the Government of India, (*b*) the planters in that country, and (*c*) the public who wear clothing dyed with this material, to take measures to ensure that the real dye shall be used, or the fact that a substitute has been used made patent to everybody. The suggestion to be made then is that our Government with the concurrence of the Indian Government, should be asked to legislate, if the object in view cannot be attained short of this, stating in effect that henceforward there shall be stamped upon each piece of blue cloth words guaranteeing that the dyeing material used in its production is natural indigo—or indigo from the plant grown in India—or, if with a substitute therefore that this fact and the name of the substitute shall be so stated upon such cloths. Further, no indigo substitute should be permitted to be imported into or sold in, this country bearing the name "indigo" or other similar name. This seems to be a reasonable request to make of the Government, and clauses could no doubt be drawn to secure the prime object in view.

Some remarks have still to be made addressed to the indigo planters themselves. In the first place, as to the exchange question, they must fully recognize the existing position, for they may rest assured the Government of India will not change its policy to please them. The report of the Fowler Committee and the action taken by the Government since make that perfectly evident. They should endeavour to get the Government to carry into effect the suggestion last above made, which from all points of view seems to be not only reasonable but necessary, for the reasons already set forth.

It is known that the planters, under expert chemical advice, are experimenting to discover whether a greater quantity of dyeing material cannot be extracted from the plant, without detriment to the quality, than has heretofore, under the old system of manufacture, been possible; but up till now it is believed that no real success has attended these experiments. Whether they will be successful in the near future remains to be seen. The steps taken are certainly in the right direction.

The next point has reference to production. There are good grounds for believing that the depressed state of the industry at the present time fortunately much less marked than it was only a few months ago, owing chiefly to the fact that the current year's crop from India is to be an exceedingly short one, has been brought about more by what may be called "over-production" than anything else. In any ease, over-production *plus* the discovery of "the new synthetic indigo," and the putting of it on the market for sale, which users of indigo have, of course, made the most of, in order to break down prices of the real article, have together brought about the depression.

Very probably,

OVER-PRODUCTION,

was due to a too large extension of cultivation, in combination, perhaps, with seasonable weather and consequent normal yield per acre. In growing indigo it must be kept in mind that a very large proportion of the season's outlay of money is incurred in preparing the lands for the reception of the seed, and that the preparation extend over months before a seed is put in the ground. Then the plant is perhaps the most troublesome to grow in India. Drought, too little rain, too much rain, rain at wrong times, all alike damage the crop, and little or nothing can be done by the planter in effecting savings in his expenditure. It is accordingly of very great importance to the planter to secure a full yield per acre, but not

otherwise. Therefore the planters themselves can well perform a part in preventing the ruin of a "threatened industry" by instructing their managers to see that only their very best lands are sown with indigo—that lands cropped for two seasons in succession are left fallow for a year—in short, that all land not capable of giving a yield per acre of 10 to 12 seers (20 to 24 lb.) under normal weather conditions is to be avoided. If this is done it is practically certain that a great step will have been taken in assuring the continuance of the industry with some profit to those engaged in it, for such indigo as is produced ought to be, on an average of years, moderate in cost, able to stand up against chemical competitors, and the market could not well be glutted by supplies.

Such careful selection of land as has been indicated will of necessity leave at the factories a larger area available for the cultivation of other crops. If we were to assume even that indigo growing were absolutely killed by chemical discoveries and were to cease to exist at some future date, then, obviously, those now engaged in that industry would be called upon to grow other crops on their land, and would be obliged to find out what crops would pay them best. In this connexion their attention may well be directed to articles which appeared in "The Times" of September 2, 8, 12, 19, 21 on the subject of growing sugar canes, and which are full of valuable information. Canes are already produced in nearly all parts of India, and in the aggregate the production must be very large.

A new kind of cane is mentioned as growing in some of the West India Islands, which yields 23 per cent of saccharose, and modern machinery is said to extract 90 per cent thereof. From such cane sugar should cost less than £5 per ton.

By way of concluding these remarks a final suggestion is made to Indian Indigo planters. Experiment at your factories on growing sugar canes, for the product from which there is an ample market at your own doors. Remember that the conditions of India in these days in respect to communications and otherwise are very much more favourable to the successful working of such an industry than in the days when sugar was largely exported from the country; also that modern sugar machinery is more efficacious in treating the canes; and if it can be clearly demonstrated that canes of the best kind can be grown successfully in Behar, and that a formerly existing industry can be established and extended, taking the place of indigo in that quarter if the worst should befall it, then assuredly the necessary modern factory will not fail to be established to deal with the canes. —*Bombay Gazette*, Jan. 23.

TEA IN CEYLON.

AGRA OUVAH ESTATES COMPANY, LIMITED. DIRECTORS' REPORT FOR 1899.

ACREAGE,

AGRA OUVAH.

Tea in full bearing	..	302 acres.
Tea not in bearing	..	20 ,,
Grass and Jungle	..	9 ,,
Total Estate..		331 acres.

FANKERTON.

Tea in full bearing	..	165 acres.
Timber clearing	..	10 ,,
Grass, Patana and Scrub	...	18 ,,
Total Estate..		193 acres.

Grand total 524 acres.

The total tea crop amounted to 293,908 lb. (or 13,708 lb. in excess of the estimate) as against 271,241 lb. in 1898.

After deducting the cost of manufacturing 131,174 lb. tea for other estates, the cost of delivering the Company's tea in Colombo was 25·18 cents per lb., which included a sum of R2,581·29 expended in additions to machinery and the building of a new watercourse, to which reference was made in the Directors' last report. The average nett prize realized for the tea was 48·90 cents per lb., against 53·82 cents per lb. in 1898. In common with other estates at the same elevation, prices in 1899 shewed a considerable fall, which was attributable to the larger demand and increased prices given for commom teas. The gross income from manufacturing tea for other estates was R15,279 66.

As the amount at credit of the Deprecation Account amounted at 31st December, 1898, to over 68 per cent of the original cost of buildings and machinery, and as the cost of all alterations and additions is now charged to Working Account, the Directors have decided to pass only 2½ per cent. on original cost to the Depreciation Account for the past year.

After making this provision the amount at credit of Profit and Loss Account for the year's working is R71,536·14, equal to 19·08 per cent. on the Capital of the Company. To the above has to be added the balance brought forward from 1898 of R16,258·44, making the total balance at credit of Profit and Loss Account R87,794·58. An Interim Dividend of 7 per cent. was declared and paid on 16th August last absorbing R26,250, and the Director now recommend the payment of a final dividend of 13 per cent. making 20 per cent for the year, and that a sum of R10,000 be transferred to a Reserve Fund for the equalization of dividends and the balance R2,794·58 be carried forward to the current year's account.

The estimate for this year is 290,000 lb. Tea on an expenditure of R77,078·78, which includes an amount of R7,752 to be expended on manuring. It is also estimated that about 100,000 lb. will be manufactured for other estates, which will leave a fair profit to the Company.

During the year under review Mr. Jas. Polson was appointed by the remaining Directors to fill the vacancy caused by the retirement of Mr. J G Wardrop on his leaving the Island; the latter was re-appointed in the place of Mr. W H Figg, who resigned.

In terms of the Articles of Association Mr. J G Wardrop retires by rotation from the office of Director, but is eligible for re-election.

GLASGOW ESTATES CO., LTD.

ANNUAL REPORT.

Directors:—Messrs. G H Alston, G C Walker, J G Wardrop.

Estate Inspector:—Mr. G M Ballardie.

Estate Superintendent:—Mr. R W Kerr.

ACREAGE.

Tea in full bearing ..	...	550 acres.
Do. partial bearing ...	...	62 ,,
Do. not in bearing ..	..	38 ,,
Grass	..	2 ,,
Jungle, &c.	...	62 ,,
Total Estate	...	714 ,,

The Directors have now the pleasure to submit their Annual Report and the Accounts of the Company for the past year.

The crop secured amounted to 335,708 lb. Tea (or 20,708 lb. in excess of the estimate) which cost delivered in Colombo 23·50 cents per lb. The nett average price obtained was 47·29 cents per lb against 49·71 cents in 1898, the fall being attributable to the partial neglect of good teas owing to the strong demand at high prices for the commoner kinds.

After making ample allowance for depreciation of Buildings and Machinery, the amount at credit of Profit and Loss Account for the year's working is R68,789·86, equal to 21·17 per cent on the capital of the Company, to which must be added the balance of R1,482·16 brought forward from the previous year. There is thus an available balance of R70,272·02, which the Directors recommend should be dealt with as follows:—That a sum of R5,000 be transferred to Extension Fund, making this fund R65,000; that a sum of R5,000 be transferred to a Reserve Fund for the equalization of Dividends: that a final dividend of 13 per cent be paid for 1889, making with the interim dividend of 5 per cent paid on 16th August last, a total of 18 per cent for the

year, and that after the payment of R300 extra fees to the Directors, in terms of the Resolution passed on 18th February, 1893, the balance of R1,472·02 be carried forward to the current year's account.

The estimate for this year is 335,000 lb. Tea against an expenditure on working account of R83,545, which includes a sum of R6,883 to be expended on manuring. A sum of R3,516 is estimated on capital account for additions to Machinery and the upkeep of the 38 acres not yet in bearing.

During the year under review Messrs. Jas. Forbes and W H Figg resigned their seats on the Board, and Messrs G C Walker and G H Alston were appointed to fill the vacancies.

In terms of the Articles of Association Mr G H Alston retires from the office of Directors, but is eligible for re-election.

The appointment of an Auditor will rest with the Meeting.

A GOOD COCOA BEAN AND A JUDICIOUS BLEND.

BY HAROLD HAMEL SMITH.

[Cocoa Correspondent to the *Port of Spain Gazette*, Trinidad, W.I.; the *Ceylon Observer*, Colombo; and the *Tropical Agriculturist*, Ceylon.]

To properly be able to tell a good cocoa bean, it is necessary that one should have a slight knowledge of its place of origin, and the circumstances under which it has been produced and prepared. This is especially the case with Ceylon cocoa, from which after Caraccas and Puerto Cabello cocoa the finest and most delicate flavoured chocolates are produced. Some even prefer the chocolate made only from the best Ceylon cocoa, and say that for delicacy of flavour this growth cannot be surpassed.

The reason of this is easy to understand when known, but can only be found out by reading up the history of the movements of cocoa from one country to another which will show that the finest Ceylons, with the cinnamon 'break' so much sought after by confectioners, originally came from the same kind, the 'Criollo' as the Caraccas and Puerto Cabello growths, the improvement in the flavor, if there is any, being due to a higher class cultivation and more careful preparation than is carried on in Venezuela, whereas in Ceylon no expense or trouble is spared to produce the best results.

For all practical purposes a confectioner need only trouble about

TWO KINDS OF COCOA

known as 'Criollo' or indigenous, and 'Forastero,' or foreign. The light 'break' and delicate flavor of the Criollo cocoa is innate in the growth, being due to the cotyledons or kernels of the bean, when first taken out of the pod, being a milky white color shaded at the margin with faint pink, which when fermented and dried, turns a light brown or cinnamon color, whilst the flavor of the seed when chewed is of a pleasant, nutty, and only slightly bitter taste, with a distinct cocoa flavor, in marked contrast to the strong bitter taste of the Forastero bean, which seem to overpower any flavor of cocoa in the mouth. The original color of the Forastero seed is a deep purple, which the process of curing turns to a medium or very dark brown, according to the time expended on its curing.

During the last fifteen years cocoas from nearly 40 different countries or districts haye been offered for sale in London. These I should classify under two heads as follows, placing them according to the strength or mildness of their flavor:—

STRONG FLAVOURED.	MILD FLAVOURED.
Africans, Surinams, Cayenne, Demarara, Bahias, St. Thome, Trinidads, St. Vincent, St. Lucia, Grenada, Tobago, Dominica, St. Domingo (Jeremie, Samana and Sauchez), Cuba and Para.	Ceylon, Java, Puerto Cabello, Caraccas, Fine Summer Arriba (Guayaquil), Colombian and Cauca, Carupano, Guiria, Peruvian, Mauritius, Seychelles, Madagascar, Tumaco, Esmeraldas, Madras Neilgherri and Jamaica.

The first six growths, as a rule prove too strong—that is, the bitterness even when reduced to powder, is too marked to allow them to be made up alone as cocoa essence, therefore I do not recommend their use in confectionery where delicacy of flavour is the first consideration; but when it is only a matter of price that alters the case. Even then I would rather use Para, which not only is the fattest of all cocoas except Surinam, but is of such a mild flavor that it can be made up with any growth, and for this reason is, I believe, much liked on the continent, very little of it in comparison coming here.

Opinions differ so much as to which blend is most suitable to bring out the full flavour of the cocoa, that it is difficult to know which to recommend. The nicest chocolate as far as flavor is concerned that I ever tasted was made entirely of fine Ceylons, and it is in such chocolate that the advantage of the 'Criollo' cocoa is particularly noticeable, for without extracting any of the fat, which contains the essential oil, and so all the true flavour of the bean, you can make your chocolate simply by the addition of sugar, whereas with the generality of Forastero cocoa, no matter how carefully prepared, a slightly bitter taste is sure to be noticeable, if not the cocoa would be found to be of a superior variety of Forestero (called Verugoso amarillo) which approaches very near to 'Criollo' cocoa, the interior of the seeds being originally of a violet color does not become so dark in curing, it also contains a somewhat smaller proportion of essential oil, and is therefore not so strong to the taste as the other varieties of Forastero.

AN IDEAL BLEND,

according to some, is an equal mixture of fine Trinidads and fine Ceylons, by which you get the superior and stronger flavor of the one, toned down by the delicate taste of the other, and the color is pleasing to the eye, a point which I do not consider confectioners pay enough attention to, especially in cheap chocolates, but from remarks I hear dropped by purchasers, the public pay quite as much, if not more attention to the color, than they do to the flavor.

As far as flavor is concerned good blends can be obtained by mixing almost any of the strong flavored growths of column I. with those mentioned in column II., preference being given price for price to those below the St. Thome in list I., for, as already stated, they are generally found to be milder to the taste. Cheaper qualities of chocolates can be made from the same growths as the best, but of cocoa, which, being less carefully prepared, sells at lower rates. As far as the matter of price goes, every maker of confectionery whether he grinds his beans or buys the chocolate *en bloc*, should watch the market reports in the trade journals or the daily papers, and note what changes have taken place, for prices fluctuate so tremendously that it is impossible to recommend any particular blend to be produced at a fixed price. Ceylons for instance, sold as high as 130s. per cwt. in 1893, but in 1895 the highest price was only 65s. 6d., which would put it within the reach of confectioners for 'bringing up' the color of all qualities of chocolates, which is not the case when fine Ceylon is about 80s. Fine Summer Arabia, the flavor of which is particularly mild and pleasant, even in the bean, also varies greatly in price, last year selling at 83s. to 85s. against only 56s. to 62s. in 1896.

To really find out which blends are the most suitable for one's trade, I would strongly recommend every confectioner to be constantly experimenting on his own account, no matter how excellent a recipe he may already have in his possession. Remember there are as good fish in the sea as out of it, and it would well repay the trouble if five or six pound samples of each growth and quality were ground up separately and portions blended together according to the color required, and the price at which the finished article is to be sold at. By so doing one can see exactly what are the results, and test which blend is most suitable to any particular trade; and even if some of the blends do not turn out satisfactorily, they

can always be used for 'foundations,' and so cost very little more than the trouble bestowed on them.

The characteristics of

A GOOD COCOA BEAN

varies in every growth. For instance, 'Calabacillo' cocoa, which forms the bulk of the Grenada crop is said to be unaffected by fermentation, so can never plump up like highly fermented Java. However, I am not wrong in saying good cocoa beans, no matter what the growth must be perfectly ripe and well fermented, which causes them to be more or less plump, and filled out; when broken they should be of a good even 'red' throughout; the bean should crack up easily, and the kernel and shell come apart without trouble. The ideal cocoa bean should have the shell a nice bright red, with a slight tendency to purple. Of late some of the Grenada Cocoa has wonderfully improved both in size and 'break,' so much so that if it is from the same 'Calabacillo' strain it has been improved beyond recognition by superior cultivation.

'Hardness of break' 'flintiness,' 'soapiness,' 'grey color,' etc., seen in beans all betoken insufficiency of ripeness and curing; the nearer the bean is to the even-coloured 'red' peculiar to its growth, the better prepared, and the riper will it prove to be.

Of all cocoas Guayaquils give the most trouble to distinguish one quality from another. This difference in the quality is due to the locality of the estate and the season of the year at which the cocoa is picked, and as localities run one into the other and seasons vary, so do the qualities of the produce, some Carraquez Guayaquil being very difficult to distinguish from some Arribas.

Beans of the purple or Forastero Cocoa, as Trinidads, Grenadas, Africans, etc., are naturally flatter in shape, and have a coarser shell than those of the Criollo kind, as Ceylon Java, etc. Columbian cocoa especially that grown in the Cauca district, runs very large in size, and is of an excellent quality and flavor, selling even higher than the finest Arribas of Guayaquil, which it somewhat resembles in shape, due no doubt to the two districts bordering one on the other.

The difference in the outside color and appearance of the various growths is due principally to the mode employed in the preparation. Some of the beans, as Ceylons, and some Jamaicas are regularly washed and all the mucilage removed, whilst in Guayaquils it is left on. With Trinidads and Grenadas it is more or less rubbed off by hand or other means, and with Venezuelian and other 'clayed' cocoas it is absorbed by the clay.—*Confectioner's Union*, Jan. 15.

INDIAN TEA ASSOCIATION.

The following is an abstract of proceedings of a meeting of the General Committee held on the 16th instant, present :—Messrs. H S Ashton (Chairman), H C Begg (Vice-Chairman), G G Anderson, W Brown, G A Ormiston, M R Quin, R R Toynbee and T Traill.

PARIS EXHIBITION.

Mr. Tye referred to the arrangements to be made in the Paris Exhibition to ensure prominence being given to the samples of Indian tea, photographs of tea estates, machinery, etc., and other exhibits sent from India. He stated that one or two octagonal kiosks would be constructed to display the exhibits to the greatest advantage. One of these kiosks woul probably be placed in the centre of the Tea Court. The London Committee had also had a consultation with the architect of the Indian Pavilion, and they had sanctioned arrangements for the filling up, decoration, and completion of the Tea Courts, which it was understood were to be in readiness by the 1st March 1900. The first instalment of the grant sanctioned by the Government of India had been paid to the credit of the Indian Committee of the Royal Commission; and a further instalment was to be paid on the 1st March next.

NEW MACHINERY.

Considered letter No. 2703 of 13th January, from Mr. J H Apjohn, Vice-Chairman of the Calcutta Port Commissioners, in reference to the machine invented by him for bulking and re-packing tea. This machine, which had been viewed by the members of the General Committee in March last, had been working experimentally since that time in the Port Commissioners' Tea Warehouse. Mr. Apjohn stated in his letter that the difficulties of detail at first experienced had been overcome, and that as a bulker or blender the machine now gave mathematically accurate results. He had also made arrangements for the tea to be repacked in the chests by hydraulic packing. This had, after experiment, proved successful, enabling the tea to be re-packed in as many seconds as by any other process it would take minutes. He submitted a statement showing that up to the present over 5,000 chests had been bulked with satisfactory results. The bulker would be capable of dealing with 500 chests an hour and the tea would be immediately re-packed. Mr. Apjohn proposed to advise the Port Commissioners to charge four annas only per chest for bulking, grossing and taring. The rate would, therefore, be one quarter of that charged in London and in addition shippers would have the advantage of the certainty of their teas being shipped in good order. He was proposing to the Port Commissioners to erect one complete bulking and packing plant in the Tea Warehouse and another at the Kidderpore Docks; and he asked for an expression of opinion as to whether the bulking would be likely to meet a want of the trade.

The Committee discussed the letter and directed the Secretary to inform Mr. Apjohn in reply that in their opinion the proposals he made would if carried out, meet a want of the trade, more especially in the case of shippers who buy tea at Calcutta auctions, and despatch it to foreign markets.

TEA SEED CONTRACT FORM.

Considered file of correspondence, in reference to the Tea Seed Contract form, issued to members under cover of Circular No. 141-O. of 11th April 1899. After the publication of the contract certain differences of opinion were expressed by the Assam and Cachar Branches and members of the Association, as to the terms of clause 5. This clause provided that in the event of the seed when tested "proving to be 10 per cent or more under the guarantee" the buyer should have the option of cancelling the contract or of taking delivery on a scale of allowances appended to the contract. There appeared to be some conflict of opinion as to the percentage which should be allowed, and at their meeting held on the 5th September, the General Committee had decided to recommend to the Assam and Cachar Branches that a blank be left where the word "ten per cent" stand; thus leaving it open for the buyer and the seller in each transaction to come to a mutual arrangement on the point. This had accordingly been done, and a reply dated 13th September had been received from the Chairman of the Cachar Branch approving of the suggestion. The Committee had also received information through the Hon. Mr. Buckingham, that the Committee of the Assam Branch, after having submitted the point to their members, also supported the proposal.

In these circumstances the General Committee decided to reprint the contract form making the change in question; and to re-issue it with a covering letter to the members of the Association. —*Planter*, Jan. 27th.

THE RUBBER PLANTING INTEREST.

To the Editor of the *India Rubber World*: It may be a matter of some interest to your readers to know that an association has been formed in Chicago for the pupose of planting about 500,000 rubber trees on the isthmus of Tehuantepec, in the Ubero district. Incidentally, during the time required for the rubber trees to mature, it is expected that an income will be derived from cattle grazing and the growing of sugar cane. The new company is known as the Commonwealth Mexican Plantation Association. It has not been incorporated, and is operated purely on a commercial basis.

Mr. Riddle personally has had planted about 200,000 rubber trees on his private estate of La Pomona, on the isthmus of Tehuantepec.

R. P. PROBASCO.

Chicago, December 19, 1899.

THE RUBBER PROSPECT IN CUBA.

To the Editor of the *India Rubber World*: I have been much interested in an article in your journal on India-rubber in Cuba. and have sent a copy to my partner, in Manila, who will, I am sure, be equally interested in the possibility of growing rubber in the new American colonies. In a few months, in connection with some others, I hope to go into the business of planting rubber, and will thank you for some information. Would you advise planting Pará rubber or *Manihot Glaziovii* in Cuba? What is land suitable for rubber, worth in Cuba and Puerto Rico? Also what is labor worth in those islands; and what would be the probable cost ot putting up necessary cheap buildings, etc.? W. W. B.

San Francisco, December 15, 1899.

[There are as yet no data available regarding the subject above referred to, which can be quoted for the guidance of intending rubber planters, beyond the fact that most attempts made hitherto to introduce the Pará rubber tree beyond its natural habitat have been unsuccessful; besides the tree requires much longer to mature than the *Castilloa elastica*, of Central America, which thrives naturally under conditions of soil and climate more nearly allied to those of Cuba and the Philippines than of the Amazon valley.—THE EDITOR.]

NOTES ON PLANTING IN MEXICO.

The Missouri Coffee and Rubber Company., capitalised at $150,000, was incorporated under the laws of Illinois, November 13, for the purpose of acquiring what is known as the "Crittenden tract," on the isthums of Tehuantepec, containing nearly 1100 acres and said to embrace some of the best rubber and coffee land in Mexico. The transfer of the estate took place November 27, it being understood that payment for the property was made in full.—*India Rubber World*, Jan. 1.

A FRENCH SCIENTIST.

Amongst recent arrivals in Ceylon is M. Emile Deschamps, an eminent French scientist, who after an interval of nearly ten years is now travelling eastwards once more, partly in the interests of commerce and partly with a view to further scientific investigations; as Monsieur Deschamps said to us in a brief conversation with us the other day "Quand on a commencé, on ne laisse jamais la science." In 1892 M. Deschamps brought out a handsome volume, *Au Pays des Veddas*, published by the "Société d' Editions Scientifiques" at Paris and illustrated by 116 reproductions of photographs taken and sketches made by the author. as well as an original map showing the route taken by him in this isle. The writer went far afield and, beside making himself fully acquainted with all that most visitors see in the island, pursued special ethnological studies among the country Sinhalese, the Veddahs and the Rodiyas. M. Deschamps' work bears marks of close and minute observation and no mean literary gifts. Our visitor spends a fortnight in Ceylon and then proceeds to Madras, before travelling further in India.

TRAVANCORE TEA SALES.

Average 8·15d. January 19th.

Garden.	Total.	Aver.	Bro. Or. Pek. or Flowery Pekoe.		Pekoe and Unassorted.		Bro. Pekoe.		Pekoe Sou.		Broken and Souchong.		Fannings, Dust, and Various.	
	Quantity.	Price.	Quantity.	Price.	Quantity.	Price.	Quantity.	Price.	Quantity.	Price.	Quantity.	Price.	Quantity.	Price.
Travancore ...	1619	6·95												
Arienkow ...	30	6½	—	—	24	6½	—	—	5	6¼	—	—	1	5½
Ashley ...	60	6¾	—	—	36	6¾	24	7	—	—	—	—	—	—
Aichencoil ...	154½c	6¾	56½c	6¾ 7¾	47½c	6¾	—	—	43½c	6½	3½c	5½	5½c	6
Balamore ...	140½c	6½	—	—	104½c	6½	29½c	6¾	—	—	6½c	6¼	c	5½
Corrimony ...	240½c	6¾	—	—	178½c	6½ 6¾	53½c	7½	—	—	5½c	6	c	5¾
Ellangy ...	108	6¾	—	—	47	6¾	22	7½	31	6½	1	5¾	7	5½ 6½
Fairfield ...	82	7½	20	8	25	7	24	8¼	13	6¾	—	—	—	—
Invercauld ...	69 p	6¾	—	—	28	6½	24	7¼	15	6½	—	—	2½c	5¾
Kanan Dev Hill M	221½c	7½	58½c	7¾ †7¾	31½c	7¼	46½c	9¼	30½c	7	1½c	7¾	55½c	6 †7
Riviera ...	40 p	6½	—	—	21	6½	10	6¾	—	—	3	6¼	6½c	5½
Seafield ...	150½c	7¼	—	—	99½c	6¾ 7	49½c	8	—	—	1½c	6¼	1½c	5½
Travan T Est B M	211 p	7	—	—	65	†6½	124	7 7½	—	—	—	—	22½c	6
W ..	14½c	7	—	—	14½c	7	—	—	—	—	—	—	—	—
Wallardi ...	100	7	—	—	42	6¾	44	7½	3	6½	2	6½	9	6½

MANILA HEMP.—The price of Manila hemp ha gone up 400 per cent. since the Spanish American War. What about the chances of growing this fibre in the Native States? There would money in it.—*Singapore Free Press.*

PROFESSOR KOEBELE:

WHO INTRODUCED "LADY-BIRD" BEETLES TO ERADICATE FUNGI FROM CALIFORNIAN ORANGE TREES.

There arrived by the ss. "Friedrich der Grosse" last evening Mr. A. Koebele, a Professor of Entomology, who has lived in America, but has for the last five years been under the Government of Hawaii, studying the beneficial and injurious insects found in that country Questioned by an interviewer the other day, Mr. Koebele stated his stay in Ceylon would be only a fortnight as he hopes to proceed to Java by the next steamer. He has no intention of studying insect life in this colony, but his visit is in another way of interest to all connected with our tea industry as he has brought from Hawaii about a dozen varieties of insects, which he hopes may counteract the evil influences of the green scale. These he is to hand over to Mr. Green. Mr. Koebele will, however, indulge in no prophesy as to the result which will attend this effort, which at present he regards in the light of an interesting experiment. Indeed at the time of speaking he could not tell whether the insects had survived the voyage and for all he knew might be now quite useless.

During his stay here Mr. Koebele hopes to visit Peradeniya Gardens to obtain some seeds or plants. Mr. Koebele gives a glowing account of the prospects of Hawaii, especially of the planting industry, which has been attended with much success by Europeans, Americans and Japanese. Coffee occupies the first place and is very fine, there being fortunately no insects to trouble the growers, while the prices obtained are good. The same remarks apply also to sugar, which is doing well. The Government of the Americans is good and the natives are rapidly becoming accustomed to western civilization.

Mr. Koebele has spent some time in Australia, collecting insects for fruit-growers in California. Asked how that country compared with Australia as regards fruit, he said the American fruit was of better quality, as the great difficulty in Australia was the lack of water.

This is not Mr. Koebele's first visit to our colony, as he had been here five years ago and he still retains pleasant recollections of what he saw and learnt on several of our tea estates.

THE TEA TRADE SECTION OF THE MINCING LANE WAR FUND.

[TO EDITOR OF THE "HOME AND COLONIAL MAIL."]

SIR, Some short time back you were kind enough to publish a list of some of the contributors to the Tea Trade Section of the Mincing Lane branch of the Mansion House Transvaal War Fund.

Shortly after the publication of that list the Mincing Lane branch of the fund was closed, but as certain companies appeared only to be awaiting the meeting of their boards before contributing, Mr. F S Long. Mr John Lloyd and myself agreed to continue to receive donations, with the result as shown in the list sent herewith.

It does not now appear likely that any more subscriptions will come in from the appeal already made, and therefore we intend closing our list. There were a few companies which did not respond to our appeal, the reason given in nearly all cases being that the directors did not see their way to voting the company's funds to such a purpose. However, with the excellent example set by the forty-one limited liability tea producing companies who have already contributed, it is to be hoped that these remaining companies will respond doubly should any opportunity for so doing occur to them.

Again thanking you for the kind assistance you have given me in the past in making this matter public in quarters where it was most needed.—I am. Yours faithfully,

—*H. & C. Mail*, Jan. 19. W. T. WILSON.

PRODUCE AND PLANTING.

TEA AND THE REVENUE.—Tea is the only import commodity of great consequence that brings a substantial payment into the Imperial Exchequer, and for the past twelve months it was credited with £4,042,680, as contrasted with £3,923,568 and £3,856,663 in the years 1898 and 1897. The duty imposed on coffee earned £187,859, which was more than heretofore, when it averaged only £174,750; and, whilst that derived from cocoa was slightly on the wane at £189,322, the Customs impost on chicory was confined to £52,042, which was a smaller sum than that raised in either 1897 or 1898.

PRODIGIOUS.—It is interesting to note that the Mazawattee Tea Company, Limited, have paid to Her Majesty's Customs the sum of £85,862 8s. 8d., representing over 5,000,000 pounds of tea. Until some rival concern goes one better, if it can, this announcement serves as a free advertisement to the company named, as it is able to state that the sum mentioned represents the largest duty payment and clearance from bond in the history of the tea trade, &c.

MINCING LANE AND THE WAR FUND.—As will be seen from a letter from Mr. W T Wilson, (Messrs. Gow Wilson, and Stanton) which appears elsewhere, the Tea Trade Section of the Mincing Lane branch of the Mansion House War Fund has now been closed. In the list which we gave on December 1 last, 14 tea companies were included, the amount subscribed being £164 5s. The supplementary list which we now give on page ii. includes 27 companies, the amount subscribed being £310, thus showing a total of 41 companies and £474 5s. This response on the part of directors of tea companies is highly gratifying, but it may be hoped, as pointed out in Mr. Wilson's letter, that, should a continuance of the war necessitate a further appeal, the few companies who have not already contributed may see their way to respond doubly.

TEA AND PAPER.—At Newcastle Police Court, on Friday, judgment was given on a charge against the Bombay Tea Company, with which Messrs. Brooke, Bond and Co. have some connection, of having offended against the provisions of the Merchandise Marks Act by selling goods with a false trade description. The allegation was that although the packets of tea sold were of the weights represented when wrappers were included, the actual weight of tea was less. The chairman, Mr. W. R. Plummer, in giving judgment, said it was contended on the part of the prosecution that the mere handing over of the packets of tea to Langley, who had asked for two half-pounds of tea, was a tacit admission by the seller that each packet contained a half-pound of tea, and that, as the packets in fact contained less, consequently there had been an infringement of the Act. The Court

were unable to adopt this contention, and dismissed the information. Mr. Clark applied for costs on behalf of the Bombay Tea Company. Langley, he said, was a purely nominal prosecutor. Mr. Ward on the other side, had practically admitted that the prosecution was by a rival firm. The Bench granted three guineas costs and agreed to state a case.—*H. & C. Mail*, Jan. 19.

SCIENCE AND SOIL CULTIVATION.

THE DIRECT ASSIMILATION OF CARBOHYDRATES BY PLANTS.

Up to within very recent times a firm line of demarcation in the vegetable kingdom has been drawn between the higher or green plants which contain chlorophyll, and the lower or non-chlorophyll-containing plants. By means of their chlorophyll apparatus, the higher plants absorb from the sun's rays energy which enables them to decompose water and the carbon dioxide of the atmosphere into their elements, from which a fairly simple chemical substance is first constructed; and then, by a progressive series of reactions, the highly elaborate and complex materials, such as starch, gums, oils, tannins and various sugars, which are easily identified as plant-constituents. The first product is usually held to be formic aldehyde, though it has not yet been identified in the plant itself as such. Many of the complex substances, however, have been artificially prepared from formic-aldehyde by the skill of the chemist in his laboratory, so that the indirect evidence is fairly conclusive, and the theory will probably be held good until actually disproved. The lower plants, however, being without chlorophyll, are obliged to make use of complex substances already elaborated. The fungi, for example, possess a destructive energy which enables them to break down for their own use, such substances as sugar, bread, wood, leather and other organic materials upon which they are commonly found growing. These are thoroughly established views. Thus in a recent *resume* of the subject of plant assimilation entitled, "The origin and formation of organic matter in plants," which was republished in the *Journal* of the Royal Agricultural Society as late as June last, a careful and detailed account of this mode of carbon assimilation is set forth. Moreover, it is the only method which the writer considers it necessary to refer to, although he deals very fully with the latest work that has been done on the allied subject of the fixation and assimilation of atmospheric nitrogen by certain families of green plants.

Evidence is now gradually accumulating, however, that this is by no means the whole truth on the subject of carbon assimilation. Since the year 1886,* when the work of Hellriegel and Willfarth and others demonstrated the extremely important part played by micro-organisms in the metabolism of leguminous plants, lines of investigation have been opened up that have shed much light on the formation of carbonaceous compounds. The final result towards which these experiments point is the possibility of green plants being able to assimilate, directly through their roots food materials that already contain complex carbon-compounds. It is only possible here to indicate the links in the chain of argument.

Winogradsky noticed that a certain lower plant, *Clostridium Pasteurianum*, was able to fix nitrogen in direct proportion to the amount of sugar supplied to it in the nutrient media. This was also found to be partly true of some common moulds, such as *Aspergillus niger* and *Penicillium Glaucum*. Mazé found that micro-organisms from a leguminous root-nodule, grown on nutritive material prepared from an infusion of haricot bean, are able to fix nitrogen when 2 per cent of sugar is added. Bouilhac has found that *Nostoc*, a green alga, in the presence of soil bacteria, fixes nitrogen in the absence of organic matter; it is true, but the yield is increased four-fold when a dilute solution of glucose is supplied, and under these conditions the organism can even grow in the dark, and form chlorophyll. Up to this point it would seem that the fixation of nitrogen is clearly connected with the presence of a carbohydrate, either specially added or present in the tissues of an associated plant, or else, to remove the cause a step further, with the presence of organisms capable of manufacturing suitable carbohydrates. Acting on the suggestion that the vigorous assimilation of nitrogen by the bacteria of leguminous root-nodules, may be due to the carbohydrates present in the legume itself, Golding has carried out pot-experiments on the effect of supplying glucose to bean, lucerne, and clover plants, and finds that a marked increase in growth is produced thereby. Further, Laurent has shown that seedling plants, such as maize, can grow, increase in weight, and form starch in the sterile solutions and in the absence of carbonic anhydride when glucose is supplied to their roots. Finally, Mazé again working with sterile water cultures, shows that vetches can be grown in the dark, at the expense only of glucose supplied to their roots. It is true that the green plants employed in these experiments belong to botanical orders that most clearly exhibit the phenomenon of nitrogen fixation through the agency of associated bacteria. Whether plants not distinguished by this property can be made to assimilate carbohydrates directly is the subject of further experiments at the present time. Should this prove possible, then a practical issue, quite apart from the extreme theoretical value of the result, may be foreseen. Sugar and other carbohydrates, though prohibited by their cost for manurial purposes on an agricultural scale, might be valuable agents for a special purpose, such as, for instance, the production of fruit, flowers and vegetables under glass and with a minimum of sunlight, at periods when they are usually obtained only with extreme difficulty.

There is also evidence in another direction that the chlorophyll theory does not explain all the facts of carbon assimilation and plant-energy. Thus, Green has published experiments from which he draws the conclusion that there exists in plants a power of absorbing and utilizing the radiant energy of light, sometimes to a considerable extent without the presence of a chlorophyll apparatus.—*Imperial Institute Journal.*

PLUMBAGO LEASES.—The new system of leasing Crown lands with plumbago seems to be working well so far as the natives are concerned. They are keen to compete for such land; and at public auction, the lease for ten years of land holding plumbago is often sold now-a-days as high as R1,000 per acre per annum! The purchaser has at once to deposit the first year's rent; but there is this proviso in his favour: that he may throw up the lease at any time, provided he has paid that particular year's rent.

CEYLON TEA IN AMERICA.

(*Communicated.*)

I am glad to see some American botanists have recently been on a visit to Ceylon, and have no doubt they will have seen much that was interesting and instructive, particularly in the matter of tea, for there can e no doubt they sadly stand in need of such information. Notwithstanding, the £57,000 or so Ceylon has spent in trying to teach our cousins it must be acknowledged our Yankee campaign has not been a success. The funny advertisements, after the style of Mother Seigel or Warner, have not been taken seriously to heart. Indeed, I understand, they have done more harm than good, and I hope Ceylon with so many real claims upon it, will soon see the wisdom of discontinuing this costly and worse than useless fad and waste. If the intrinsic merits of the article are not sufficient to recommend it and push it, as they ultimately did in Australia and elsewhere, no amount of blatant advertising will do it. Of the need of more solid information on the subject, I have been forcibly reminded by perusing a paper in one of their scientific journals by a leading savant, in which paper he tells us that the world's yearly consumption of tea is 3,000,000,000,000 lb. which means say 2,000 lb. per head for every man, woman and child in the wide world! Whereas the editor of the *Tropical Agriculturist* has evidently been under the impression that the world's yield of tea was little more than 1,100 millions annually, and the consumption from a few ounces to 10 lb. per caput.

Again, I had no conception of the dangerous nature of the article till I read this:—"In a pound of tea there are 224 grains of poison, or enough to kill 45 rabbits." What puzzles me is the recollection that I used to feed my rabbits on tea leaves—theine, tannin, and all. The rabbits got fat on the leaves, my children got fat on the rabbits, and no one was a bit the worse! Altogether, this Yankee "information for the people" seems so extraordinary and incredible, that I cut out the article and send it to you as a curiosity, worthy of a place in your Museum, or say your "T.A." as a warning to others.

TEA AND COFFEE AND THEIR EFFECTS UPON THE BODY, BY W. H. RILEY, M.D.

Tea is one of the great articles of commerce, the estimated annual consumption being three billion pounds. It is a shrub native to China, but is now grown in India and other tropical countries. The tea-shrub, in a wild state, grows to a height of twenty to thirty feet, but is limited in cultivation to five or six feet, with numerous branches, and evergreen leaves, in the axils of which are to be seen the large, white, fragrant flowers. The leaves, though evergreen, are picked only at certain seasons. The first tender leaves of early spring are gathered for the finest young hyson. The later leaves give so-called inferior qualities of tea. After gathering, the leaves are first roasted in such a way as to produce variety in flavor and odor, and then treated to give different colors. For green tea, the leaves are roasted immediately after gathering, rolled with the hands, then re-roasted. For black tea, the leaves are first exposed to the atmosphere for a few hours, then roasted a few minutes, rolled in the hands, exposed to the air again for a few hours and finally slowly dried over charcoal fires until the black color is well brought out. After this preparation, the tea is ready to ship.

The use of tea as a beverage was introduced into China from Corea, about the fourth century after Christ. From thence it extended to Japan about the ninth century, finding its way into Europe in the sixteenth century, where it met with great favor, and is to-day the favorite drink in England, Russia, and Holland.

We have already noticed that the chemical analysis reveals as a principal ingredient in both tea and coffee the narcotic alkaloid thein, or caffein. By experiments upon animals with this narcotic, it is found to be a deadly poison. Taken in a concentrated form, death speedily ensues. One seventh of a grain is sufficient to kill a frog, and five grains will kill a rabbit. In a pound of tea there are 224 grains of this poison, or enough to kill forty-five rabbits. Seven or eight grains will cause most distressing symptoms in a strong man, and a slightly larger dose causes highly dangerous symptoms. Dr. Smith, a prominent English physician, in experimenting with the effects of coffee, took, with his assistant, an infusion of two ounces of coffee; they both fell to the floor unconscious, and remained in that condition for several hours. We quote the following incident as illustrative [of the effect of tea:—

"A prominent official in the British army, now doing service in Africa, recently lost his horse in a manner that is both singular and instructive. A cook left a few pounds of tea in the sack which had contained it, which was filled with corn by a Kafir groom who knew nothing of the presence of the tea. Upon serving out the corn to a group of horses, of course the last one received the larger share of the tea, which was eaten with the corn. The result is thus described:—

"'The animal plunged and kicked, and ran backward, at intervals galloping madly around, finally falling into a donga, where it lay dashing its head upon the rocks, and was despatched by an assegai thrust through the heart. The post-mortem appearances indicated extreme cerebral congestion.'"

The action of tea and coffee as ordinarily used is not as rapid and marked in its injurious effects as seen in the above instance, as the quantity used is not so great, and the system also becomes accustomed to the narcotic; but serious derangements of the digestive and nervous system result therefrom.

"The relief obtained from tea and coffee is sudden, before the stomach has time to digest them. This shows that what the users of these stimulants call strength is only received by exciting the nerves of the stomach which convey the irritation to the brain; and this in turn is aroused to impart increased action to the heart and short-lived energy to the entire system. This is but false strength, that we are the worse off for having. They do not give a particle of natural strength." Though there is greater ease in making exertion, a greater sense of exhaustion follows than when the drink is not taken. "Under the influence of these poisons the nervous system is excited, and in some cases, for the time being, the intellect seems to be invigorated and the imagination more vivid. Because the stimulants produce for the time being, such agreeable results, many conclude that they are actually beneficial, and so continue their use. But there is always a reaction. The nervous system, having been unduly excited, borrows power for present uses from its future resources of strength. All this temporary invigoration of the system is followed by depression." The head-ache removed by a cup of tea invariably returns, and the continued use of tea serves only to aggravate and increase the difficulty, of which it is frequently the source. Those to whom tea and coffee take the place of other food are generally found with hollow cheeks and

thin faces, indicating the lack of nourishment from these beverages. And who is more tremulous than the old lady who regularly takes tea to quiet her nerves?

We see then that seeming good derived from these drinks is only the deceptive influence of this narcotic poison. We may now notice specifically the effects upon various bodily organs and functions.

First, the digestive system. One very important part in the digestion of food is the action of the saliva upon starch, converting it into a kind of sugar called maltose, whereby it is readily absorbed and assimilated. This action of the saliva upon a large per cent. of our food is prevented by tea and coffee, even in small quantities, thus producing one of the commonest forms of indigestion, viz., starch digestion. The constituent in saliva which changes starch into maltose is known as *ptyalin.* This seems to be paralyzed in its action by the presence of the poisonous thein, or caffein. The action of the saliva is not confined to the mouth, but continues in the stomach until the contents of the stomach become acid in character by the introduction of the gastric juice. Hence, as the tea or coffee is present in the stomach, the action of the saliva is interfered with here also.

The pepsin in the gastric juice of the stomach is one of the principal factors in the digestion of albuminous substances, such as meat, boiled eggs, gluten, etc. This very important agent is precipitated by the tannin in tea and coffee, thus seriously interfering with the work of the stomach. In experiments made for the purpose of determining the influence of tea and coffee upon digestion, it has been found that in a case where, under ordinary conditions, there was ninety-four per cent. of albuminous digestion. upon the addition of tea, the amount of digestion was only sixty-six per cent., and with coffee, sixty-one per cent. When distilled water was added instead, there was no change in the amount of digestive work done, so that it is evident that the change was not due to the simple dilution of the digestive fluids.

Then again, the use of these beverages is injurious in taking into the stomach too large a quantity of liquid food. The effect of this is to check the secretion of saliva, and to delay the action and weaken the digestive qualities of the gastric juice. If the drink is hot, it tends to relax and weaken the stomach; if cold, it checks digestion by cooling he contents of the stomach down to a temperature at which the work of digestion cannot proceed. Hence we see that the drinking of tea and coffee is one of the causes of the dyspepsia evrywhere prevalent.

Upon the nervous system a very injurious effect is had. Upon the introduction of tea or coffee into the stomach, and the absorption of the the in the drug is at once recognized by the system as a poison, a dangerous intruder, which must be expelled at once. The whole nervous system is aroused to energetic work, stimulating the heart, lungs, and kidneys to increased activity in order to get rid of the poison. Although the nerves may have been "run down," as we say, they are now so braced up that the person supposes that he is being greatly benefited; but after this exertion, the nerves are weaker than before. It is like a man, weary with his day's labor, plodding his way homeward. He is so tired that he can hardly place one foot before the other; but as he comes in sight of his home, he sees his dwelling in flames, or a child in danger. The sense of danger causes him to forget his weariness, and he works with energy until the danger is over; but afterward comes double exhaustion. He is more tired than at first, though for a time he had no sense of fatigue. So it is when the nerves are stimulated to undue action by the presence of this poison. The relief is only temporary, while future years are sure to bring a harvest of suffering.

A SUGAR GROWING INDUSTRY FOR CEYLON.

VISIT OF MR. TURNER OF THE STRAITS SUGAR COMPANY, LIMITED.

It is possible that we may have to date a new departure in the agricultural industry of the island from the visit of Mr. J. Turner, of Penang, which has just closed. Mr. Turner was not able to do as much as he had planned in the only fortnight he could spare; because he landed suffering from the effects of an attack of influenza caught after leaving Marseilles. Still, through the courtesy of H.E. the Governor in granting him letters to several of the Provincial Agents, through calling on the Colonial Secretary—who knew and esteemed Mr. Turner's superiors during the latter's sixteen years in Demerara—through examining plans and maps with the Surveyor-General and getting the benefit of that energetic officer's acquaintance with the country, as also through having the advantage of a very instructive letter from Mr. Ievers and opinions from Mr. Fisher and others,—Mr. Turner was able to decide on a course of action before leaving our shores. A visit to Anuradhapura, even though he only gave it a limited number of hours, convinced Mr. Turner (shrewd Scottish planter and agriculturist as he is) that not in this locality, nor farther North, must he look for sugar land: but rather towards the East. Mr. Turner came to this conclusion from what he observed on the coach journey between Dambulla and the North-Central capital, so that he saw no need to linger there or to penetrate into the Northern Wanni. As a matter of fact, this opinion coincides with that offered by Mr. Ievers and Mr. F. H. Grinlinton. The best soil for sugar is to be found near the banks of the Mahaweliganga below the Minneriya tank or in the neighbourhood of the great tanks north-west of Trincomalee referred to in the Survey Reports of last year. Of course, the soil has to be practically examined and tested, the climate (with reference to monsoon floods especially) and means of transport investigated; and Mr. Turner is by no means the man to hurry to a conclusion where so much is at stake. But he saw and learned enough,—he was especially pleased to learn how mangroves flourished in the districts recommended, because it has passed into a proverb that where mangroves luxuriate, sugar-cane will succeed,—to feel justified on Saturday in sending in a letter to Government asking on what terms and conditions would his Company get a lease of 10,000 to 20,000 acres of land in one or other of two districts named, provided after further inspection, the selection proved suitable. For less than ten thousand acres, the Straits Sugar Company (which has its headquarters at 110, Cannon Street, London) would not care to come to Ceylon; and as the opening up of so large an expanse of country means a heavy local expenditure, apart from some £50,000 on a suitable factory and machinery, it is evident that the terms offered to this pioneer undertaking must be specially attractive. Of course, it will be for the Government, on the other hand, to take every precaution to guard against a merely temporary speculative enterprise, or a breach of

the conditions imposed; to ask, in fact, for such guarantees as may ensure good faith. The Ceylon Government has had a good deal of experience now of land "grants" and "leases," and must be well able to protect the Crown and the public. But, in the present instance, we confess we can see no room for suspicion or doubt. Sir John Ramsden, Bart., and his fellow-directors are known to be wealthy and enterprising capitalists, and they have ample reason to trust the judgment of their Agent and Manager, Mr. Turner, with his ten years' experience of Penang, in addition to a long spell in British Guiana. Should the answer of the Ceylon authorities to Mr, Turner's letter of enquiry be satisfactory, it is his intention to send over a competent member of his staff (they number 38 Europeans in all) during March, to traverse the Tamankaduwa and Trincomalee districts examine the soil, drainage, river—if navigable, &c., and make all other possible observations to help to a decision. Mr. Turner himself would then follow in August—the driest, hottest month of the year in the North-East—in order to see for himself how matters look at their worst. A final decision will then be arrived at, and the land be taken up, or else the scheme be abandoned.

The revival of profitable Sugar Cultivation in British Dependencies of late years is very noteworthy. Even in British Guiana, and yet there are many plantations abandoned that were once flourishing, there are others still paying their way, although the produce realizes now only £10, in place of £35, a ton. The latter marks the day when it used to be said that "a sugar estate maintained six carriages and pairs" of merchants and agents, apart from proprietor and manager! Mr. Turner passed through the days of adversity when the screw was applied all round salaries cut down, and a course of rigid economy adopted. And looking around him while in Ceylon, he told us he could not help thinking that, judging by the prevalent tone, there was still room for economy, for closer attention to supervision and to outgoings in all their detail, in regard to work on, at least, some of our tea plantations. In Penang, as we have already mentioned, it is reckoned that the return from two tons of sugar per acre is as good as from estates yielding three or four tons in Java. Of course, one great attraction to his Company, in thinking of taking up land in Ceylon, would be a cheap and abundant labour supply. We have pointed out to him, however, that our tea planters would be up in arms if their cooly districts were interfered with; but that he ought to have the full support of both the Ceylon and Indian Governments, if he applied for the transfer of a large number of labourers from points adjacent to the famine districts in India, to a country and climate so like their own as that of North-East Ceylon. He and his staff would also be very glad to utilise any local labour of Sinhalese or Moormen, giving them land and advances on easy terms, in order to grow canes in their gardens, for which there would be a ready purchase at the Central Factory. We have said enough to show that Mr. Turner and his Company are in earnest in approaching the Ceylon Government; that there is much reason for encouraging any well-considered proposal to open up unoccupied territory in North-East Ceylon; and that the addition of successful sugar-growing on a large scale to our list of agricultural industries, could not fail to benefit the native community and general revenue. Fortunately, the Governor has at this juncture an adviser in Sir Edward Walker who is very familiar with the subject of Sugar Cultivation in the West Indies and Guiana, and who will be able, therefore, to see that Mr. Turner and his Company are dealt with prudently as well as generously and with a due regard to all the interests at stake.

INDIAN COMMON TEAS.

HOW TO PUSH A SALE IN THE COUNTRY.

The field which is open to pushing our common Indian teas throughout the country is one which might engage the attention of the Tea Association. It is many years since we advocated this, and as yet no steps have been taken beyond the Indian Snpply Tea Company. The progress of the Company has been but slow, but last year's report reads as if it was coming on a bit now, and we hope it may. There are of course a great many difficnlties to face, but we believe, if vigorously pushed, there is money in it. A few years ago, we suggested asking the different inland river companies to allow their staff to undertake the sale on the steamers on commission, and we have do doubt but that they could be approached with successs on the subject, and we commend the idea to the Indian Tea Supply Company. It seems rather a disgrace to our mercantile push that nothing but Lipton's Ceylon tea can be obtained to drink on board those inland steamers. Here are the tea-planters, almost the backbone of the India General Steam Navigation and River Steam Navigation Companies, being ousted in the matter of supplying tea to drink at their very doors. Who is accountable for this? In addition to this, why are not teashops opened at the gates of the large jute mills? The jnte coolies is by no means above wanting his morning cup of tea, as might be seen by any one walking out in the morning in the vicinity of onr very oldest jute factories; but it is not general, although it onght to be. We suppose it is the old story, what is so many peoples' business is no one's in particular. On our great Indian railways we understand a good deal of revenue is derived from selling the right to deal in sweetmeats, *pan*, &c. Why shonld not tea be treated in the same way? How mnch better for the traveller to have a cup of tea in the hot weather to quench the thirst than water, which, to say the least, looks far from clean, and the look of which, at any rate, viewed from an European standard, is revolting. We feel certain that many an outbreak of cholera would be prevented were the system put on its trial. Water, however dirty, is looked upon as safe to drink if it has been boiled, and we think that our idea might commend itself to a Government striving after sanitation. The amount of tea that is annually stolen from factories (the amount it is difficnlt even to estimate) shows that the native is by no means avers to the cherry cup, and if this is the case, how much more so is it in the North-West, Tirhoot, and Behar. The writer of this in the Behar Famine of 1875, had occasion to tra-

vel through those districts, and on several occasions was obliged to fall back upon the native bazars for tea and never had any difficulty in getting it, but it was invariably Chinese, no Indian was obtainable. The snuff, for such it invariably looked like was the commonest of dust and was being retailed at about Re. 1-4 to Re. 1-8 per pound. The packages was wooden, and weighed about an ounce and was sold at from 3 to 5 pice; and we are not presuming too much, we think, when we say that judging from the Customs entries, the same trade is still being carried on increasingly, and we think we need hardly add profitably. Does any Indian tea find its way into Ceylon? We don't think so, but a good deal of Ceylon finds its away into India. Another year or two will see a heavy strain on the London market, not so much from the increasing area in Assam and the Dooars, as extensions have received a big check there; but, from all we can gather, there must be a very large amount to deal with in the near future from Travancore, or, perhaps, a better term would be Southern India, and, if we could only lighten London of 6 or 7 millions of the lower class of tea during the next year or two, it would tend greatly to strengthen the market, and there is, we hold, no reason why this should not be done; but energetic measures must be introduced. Tea must be sold by the cup at a cheap rate, and small packets done up attractively must be alongside to tempt the drinker to invest. Shops should be established in the great fairs, at places such as Benares, Lucknow, Agra, and Cawnpore; and the Brahmin should be enlisted to conduct these. Without some such vigorous methods the heathen Chinee will still continue to hold his own successfully. A retail trado may not fall in with the views of our large Calcutta mercantile community, but whichever pays must rule the roost; and we have no hesitation in saying, if the native is to be taught how to drink tea, and to pay for it, vigorous measures must be adopted, and, if these are introduced, the return on capital invested would be much greater than in some more high flown speculation. The trade would be a cash one, and there would be, or rather should be, no bad debts, and no expensive establishment to keep up for accounts. In fact, everything should be paid by commission, and worked on the cheapest of lnes, and if this were done there is no need tofear the result.—*Indian Planter's Gazette.*

SOIL EXHAUSTION

BY J. L. THOMSON, TRAVELLING AGRICULTURAL INSTRUCTOR.

All branches of Agriculture in Australia will have greatly advanced when the farmer shall have learned to treat the soil as he would a bank account. No one expects to draw money from a bank continually without paying in anything, for the time would come when the cashier would write across the face of a cheque "No Funds," and it would be returned to the drawer dishonoured. And yet it is just as unreasonable to expect the soil to keep on, year after year, satisfy the heavy drafts that the farmer makes upon it. There is this diference, however, between the soil and a bank. The bank gives no notice of the progressive exhaustion of the deposit. So long as a cheque or draft does not exceed the amount of the credit, the cashier pays it without a word of warning. It is not his business to caution the depositors. The soil on the other hand warns the cultivator of its exhaustion by a decline, in the yield. The warning of fertility is plainly shown in the partial failure of crops. In the older wheat-growing areas this lesson is given on the lands long tilled, but still the resort to fertilising is generally postponed. This is largely because the Australian farmer rarely look upon his land as a heritage to be transmitted to his children undiminished in fertility and productiveness. The farm in many parts of Australia is not commonly regarded as a permanent home for the family and its descendants, as is done in the old country, but merely as land to be worked for all that can be got out of it, leaving posterity to shift for itself.

This view may be justified from the fact that posterity has done nothing for us. It certainly does appear that Australian posterity, at least in the abstract, will be left to "hustle" so far as this problem of fertilisation is concerned, A very little calculation would show that at prevailing prices for wheat there would be little or no profit in growing it, if the fertility it takes from the soil were to be restored by manuring in any form. So little live stock is kept on our wheat farms that the purchase of commercial fertilisers would be the only means of restoring the plant-food taken away by the crops.

The cost of such fertilisers is regarded as practically prohibitory, so far as grain-raising is concerned, and so the present exhausting system continues.

The prospect, of course, is rough for the future, but the present attitude in this regard is virtually "let the future take care of itself." There are, however, many comparatively young farmers who will be compelled by the poverty or failure of crops to grapple for themselves with this question of fertilising, for it is one that cannot be put down. It is mere folly to ignore the fact of decline of fertility and pure ignorance to insist that the full productiveness of soil can be kept up without replacing the costly phosphoric acid, potash and nitrogen that are taken away by the crops. The lesson of the situation is for the farmers to turn their attention to other crops than wheat, and to practise some system of rotation. Much improvement may be brought about by dairy-farming in suitable districts with or without irrigation, but no great change is to be looked for until, in one way or another, the large farms are subdivided, and small farming become, general, rather than the exception. The subject has many aspects and is entirely too comprehensive to be discussed adequately in a short article. —From the *Agricultural Gazette* of New South Wales.

COCHIN MARKET.

C. N. OIL.—The European Houses having accepted a few contracts caused prices to harden and rates advanced to R88 to R88·4 per candy at which figures a good business has been done mainly for prompt delivery.

COIR YARN.—Continues unchanged. Advices of the first public sale in the year held in London, on 12th ultimo, were received here by the Overland Mail of the same date and we find the parcels offered changed hands at steady prices.

ROPE YARN.— Ditto.

COIR ROPE.—With larger arrivals prices have somewhat declined in London. Good Anjengo yarn ropes fetched only £20 per ton at the last public sale.

COPRA.—Rassi R52·53 per candy.—*Cochin Argus*, Feb. 3.

COCONUT PLANTING ON N.-W. COAST.

MARAWILA, Feb. 6.

WEATHER AND CROPS.—We, in the North-Western coast of the island, were not favoured with the showers of rain that fell last week in Colombo and even as far north as Negombo. The chilly, dewy mornings and the fiercely hot days indicate a period of drought. This is likely to seriously affect coconut crops as we had a failure of the N.-E. monsoon rains. This is the season of small crops, and, as a consequence, the price of coconuts and copra is rising. The local desiccating mills, however, have not raised their rates for buying coconuts as yet. They will have to do it before long to keep their mills agoing.

FARMERS AND THE ROADS.

The following extracts from an article by a Florida farmer in one of the leading American journals seem to be worthy of consideration :—

It is easily possible for farmers to keep country-roads in a much better condition than most of them are at present. The individual can afford to do road mending on the same principle that he repairs fences and buildings: "It pays me;" and a land-owner ought to feel as much shame, even guilt, before the general public over a mud-hole that can be drained, or over a choked-up sluice along his premises, as he ought over neglected cattle or a display of filth.

It is not necessary to wait for the road-working season to come. The most profitable, common-sense work can be put in a little at a time, if at the right time. Drainage is the beginning and the ending of the whole matter, if roads are to be roads and not sloughs. Watering-troughs and hill-side springs are common causes of standing water, yet it is a very simple matter to direct the water flowing from them in the way it should go. A stone, a loose board, a chunk of soil washed down against the end of the sluice, may choke it up till it is worse than nothing. Five minutes' work would send the water rushing through its proper channel. It is not uncommon to see water following the wheel rut for rods, when a man with half an eye can also see that a mere cut through the rigde at the edge of the road would lead the water into the ditch—perhaps down a bank.

Dropping into a bad hole or soft place a few superfluous stones now and then to keep the water out would work a double headed blessing to all passing that way. Heaving out a few stubborn old stones from the track would work a detriment to the blacksmith and waggon maker perhaps, but a big saving to the farmer. If all such patching were thus well kept up, the yearly toll of public service would count more and more toward the good roads of which all are dreaming and talking. This view of the subject is no more than one feature of practical farming, intelligent economy, a mere looking out for number one, no matter how many others are also benefited.—From the *Agricultural Gazette* of New South Wales.

SALE OF RUBBER FROM THE CHARDUAR PLANTATION IN ASSAM.

The Assam Forest Department sold in London the first produce of the Charduar Rubber Plantation at R2-8-6 per lb. The cost of transport from Tezpur and agent's and sale expenses amounted to R0-3-7 per lb. We were offered in Tezpur R1-14-6 per lb. By sending it direct to the market we profited R0-6-5 per lb. The total net profit was R1-2-6 per lb., but this is of no special interest, as the cost of collection was rendered exceptionally high by inexperience and bad weather.—*Indian Forester*.

PLANTING NOTES.

RUBBER SUPPLY DWINDLING: SUBSTITUTES USED.—The rubber supply of the world is running short, and people are asking where our future tyres are to come from. Happily, there are one or two inventions before the public as a substitute for rubber. The nearest is "velvrill," prepared from semi-dried linseed or castor oil. These oils are treated with nitric acid, forming what is called "nitrolinolein" or "nitroricinolein." This preparation is then mixed with nitrocellulose, of a very low degree of nitration, and the whole worked into a homogeneous mass.—*Daily Chronicle*, Dec. 13.

SOME FRUIT CROPS OF 1899 IN CALIFORNIA.—We have been informed that this Garden of America has produced 5,250,000 lb. of Figs last year, against 4,780,000 lb. in the preceding year. The "Pack" of dried Peaches on the coast is placed at 28,300,000 lb., against 10,960,000 in 1898. The Apricot crop of last year was 7,000,000 lb. compared with 8,240,000 lb. in 1898.—*Gardeners' Chroniecle*, Jan. 20.

EXPERIMENTS IN MANURING.—From a paper on the "Arrangement of Experimental Plots in Gardens," issued by the South-Eastern Agricultural College, Wye, the following are mentioned as being the requisite amounts of manure and the right proportions of their constituent parts: "The quantities required are 2 oz per square yard of nitrate of soda sulphate of ammonia, and kainit; 4 oz. per square yard of basic slag or superphosphate; and 1 lb. per square yard of lime." Of course, many other measures will supply nitrogen and phosphoric acid, but the above are the most convenient.—*Gardeners' Chronicle*, Jan. 20.

ECONOMIC PROGRESS IN PERU.—Our Correspondent writes on December 9th last from Lima:—With the cessation of internal disturbances there is every reason to hope that Peru will make substantial economic progress in the near future. Industrial enterprise is everywhere increasing, notably so in the direction of the production of sugar, the crop of 1899 being fully 15 per cent greater than that of 1898. A larger area of land is being devoted to cane cultivation, and this means that the production for 1900 and 1901 will be considerably heavier than in the present year. Limited libality companies are now being formed to assist the development of the sugar industry in Peru, and by this means the necessary capital will be obtained for the erection of the required machinery, and the further extension of the cane fields. Small estates will no longer require separate mills in many districts, the principle of establishing central factories for the elaboration of the cane into sugar having been recently adopted in several of the most prominent sugar-producing sections of the Republic. Improved accommodation for the working men on many of the more important plantations is solving the difficult problem of a steady labour supply to a marked degree. Moreover, more energy and a closer attention to work are being shown by the planters than have been the rule in former years. The higher price of copper during the past 12 months has opened up fresh possibilities for the mineral industry of Peru, and the export of copper ore will form a valuable item in the list of Peruvian exports for 1900. The centre of the Peruvian mining industry is at Cerro de Pasco, situated only 65 miles from the Central Railway of Peru, now in the hands of the Peruvian Corporation. Railway communication once finally established between Cerro de Pasco and the seaboard, and adequate transport provided by a re-equipment of the Central Railway with freight wagons and locomotives, means an immense development in the working of copper ores. The cost of constructing the necessary 65 miles of line to open this communication is estimated by competent engineers not to exceed £500,000, and the prospects of traffic over such a railway assure satisfactory returns on the capital invested in the undertaking. Naturally, it is the Peruvian Corporation which should take the initiative in this enterprise, for the reason that the new railway will act as a feeder to the centre line. The corporation, unfortunately, however, are at loggerheads with the Peruvian Government, and make small effort to improve their own position by extending the railway system they now control. —London *Times*.

INDIGO AND SUGAR.

THE connection between the two products may not seem very apparent, especially to those who have not any practical acquaintance with either; but in India attention is being drawn to them as helpful to each other in alternate years. Our interest in the connection is neither academic, nor purely scientific. Though Indigo has never found a place among our varied industries—save for a few scattered experiments in the time of the Dutch and the beginning part of the present century—Sugar attracted considerable attention in the earlier years of British occupation: and it still flourishes on a small, but, we fear, a steadily decreasing scale. We are however, now, entertaining the hope (as shown the other day) that it will yet figure, if not as one of our greatest industries, at least as a considerable one, if the expectation prove well founded, after the promised examination of the land along the Mahaweliganga by experts in March and August next. In India, as our readers are aware, Indigo has for some time been in a bad way, chiefly through the competition of artificial dyes. As in the West Indies, so on the adjacent Continent, the opinion is gaining ground that the planters have the remedy to a great extent in their own hands. They may be helpless, without the aid of the State, to protect themselves against fraudulent imitations of Indigo, but the Government will surely help them, if they only ask it for help, against the false representation of a substitute as Indigo. The security thus gained is not all that is wanted. There will be a market for the artificial dye, even when so described, and even if it be proved inferior to the vegetable product originally known to the trade as Indigo; and so far as the competition goes, the demand for the true Indigo will be lessened. In order to check the fall in prices inevitable from over-production, a lessened output is counselled by a writer to the London *Times*, who advises the planters to agree among themselves to devote only the most suitable portion of their lands to Indigo. The counsel is undoubtedly easier to offer than to follow, but it is not impracticable, and when the alternative is loss, if not ruin, an earnest effort to act up to the advice will be true wisdom. And if the land thus left unoccupied can be put under sugar-cane, as is suggested, there need be no special difficulty in following the advice.

There is, of course, the prejudice against Sugar as an industry often which leaves small profits: but it was shown in recent articles how returns have been almost doubled by judicious cultivation, and the proportion of Sugar has been increased by the choice of good seed. So far as India goes, there is the further protection which legislation has secured by countervailing duties against bounty-fed competition. It is further claimed that the new seedling canes which have been recently introduced into Barbadoes, have proved that profits are realisable from Sugar even at prices considerably lower than those which have been ruling lately. And further, Java is quoted as an illustration of the possibility of combining the cultivation of Sugar with that of Indigo. A botanical expert, reporting to the Belgian Government on the methods adopted in Java, mentions the practice of rotation with the best results by the Java planters who alternate the cane every third year with indigo and rice. It is not by rotation of crops alone that Java is deriving handsome returns from Sugar, It utilizes European science, and pays strict attention to details; and, as we are ourselves organizing an Agricultural Department, there is no reason why Ceylon should be behind any other country in securing adequate results from the soil. This is what we read of Java:—

"Instead of wringing their hands, like the West Indian planters, and crying to the mother-country for aid, the Javans, when the crisis came, set to work to apply German science to their own plantations. The sugar-growers formed themselves into an association for the purpose of the scientific study and development of their own industry. Experimental stations were established, with chemical and biological laboratories attached, and European specialists were engaged at high salaries to superintend the work of these stations. The progress of the experiments was regularly communicated to all the planters throughout the island, by means of a periodical publication, which was also used to describe the latest machinery and to deal with any other matters affecting the industry. The result is that Java has completely recovered from the temporary ruin brought about by low prices, and that her sugar industry is now going ahead by leaps and bounds. If this can be done in Java, why not in India? Java has the disadvantage of being compelled to seek a foreign market for her sugar, and in nearly every instance has to fight her way into that market across a barrier of protective duties. In India there is an immense home market waiting for the capitalist who has the intelligence to produce sugar on European methods."

What is said of India applies, of course, to Ceylon, which imports a very considerable quantity of Sugar.

THE SHEEP OF THE WORLD.

As regards the number of sheep, the following figures showing the number possessed by each country in the latest year, for which returns have been published, are noteworthy:—

Algeria	7,435,000	India British	16,875,000
Argentina	75,000,000	Italy	6,900,000
Australasia	103,000,000	Norway	1,417,000
Austria	3,187,000	Poland	3,755,000
Belgium	236,000,000	Romania	5,002,000
Bulgaria	6,868,000	Russia Europe	44,465,000
Canada	1,690,000	Servia	3,094,000
Cape Good Hope	14,000,000	Spain	13,359,000
Denmark	1,246,000	Sweden	1,298,000
France	21,445,000	Switzerland	272,000
Germany	10,866,000	U. S. A.	37,657,000
Holland	700,000	Uruguay	16,397,000
Hungary	8,122,000		

The great sheep-breeding countries of the world, therefore, so far as these figures show, are Australasia, Argentina, Russia, and the United States. All of these possess more sheep than the United Kingdom, which in 1898 had 31,102,000. But in proportion to area the United Kingdom enormously surpasses them, the four countries mentioned having, of course, immense territories,

The figures, which are given in the Agricultural Returns, shows that the United States cover 2,292,000,000 acres; Australia, 1,974,000,000 acres; Russia in Europe 1,244,000,000 acres; and Agentine, 715,000,000 acres. The United Kingdom, on the other hand, covers only the comparatively insignificant area of 77,000,000 acres.—*Agricultural Gazette*, London.

KANAPEDIWATTIE TEA CO., LTD.

DIRECTORS' REPORT.

The Directors have pleasure n laying before the Shareholders their Report and Accounts f or the year ended 31st December, 1899, which they trust will be found satisfactory. The following figures shewing the crop, cost, and average of the tea for the past three years will be found interesting :—

	Crop in lbs.	Cost in Colombo.	Nett Average.
	1897.		
From Estate Leaf ...	122,095	25·88	34·18
From Bought Leaf..	22,095		
Total Crop..	144,190		
	1898.		
From Estate Leaf ..	142,267	23·11	32·71
From Bought Leaf..	30,330		
Total Crop..	172,597		
	1899.		
From Estate Leaf ..	151,030	21·92	36·16
From Bought Leaf..	38,565		
Total Crop..	189,595		

It may be mentioned that the estate tea alone cost cents. 19·94 lb. laid down in Colombo, which reflects great credit on the Superintendent, Mr. Geo. Christie. The crop was 3,970 lb. short of the estimate, but the yield was 543 lb. per acre which may be considered good, as no allowance has been made for cocoa, cinchona and shade trees planted here and there through the tea.

The net profits for the year amount to R44,779·51, which is equal to 13$\frac{3}{5}$ per cent on the paid up Capital of the Company as against 12 per cent last year.

Including the sum of R771·24 brought forward from last year, the amount available for distribution is R45,550·39, of which R13,360 has been absorbed by the payment of an interim dividend of 4 per cent for the six months ended 30th June last.

The Directors recommend that the available balance, namely R32,190·39, be apportioned as follows :—

By the payment of a Final Dividend of 6½ per cent, making 10½ per cent for the year	R21,710·00
By placing to Reserve Fund ..	10,000 00
By carrying forward to the next account	480·39
Total..	R32,190·39

It will be noticed that the Reserve Fund will then stand at R25,000.

In terms of the Article of Association, Mr. George Christie retires from the Board of Directors, but, being eligible, offers himself for re-election.

The Auditor, Mr. J. D. Forbes, also offers his services for 1900.

YATADERIA TEA CO., OF CEYLON, LTD.

DIRECTORS REPORT.

The directors have the pleasure to submit the Balance Sheet and Profit and Loss Account for the year ending 31st December, 1899, duly audited.

Including extraneous profit from outside manufacture the profit for the year is R88,477·70, to which must be added R9,850·87 balance from 1898. An Interim Dividend of 12½ per cent, absorbing R23,750, was paid last August, and the Directors propose that a further Dividend at the rate of 12½ per cent and a bonus of 20 per cent., absorbing R61,750, be declared and made payable on the 12th instant, leaving a balance of R12,828·57.

It will be seen that the property representing Capital stands in the Balance Sheet at approximately R197 per acre cultivated, as compared with about R200 in the previous year's accounts, and that the profit is R100·54 per acre in bearing, and 46·56 per cent on the Capital.

The total Tea crop was 572,138 lb. or 17,138 lb. more than the estimated quantity, the latter part of the year having been more favourable. The plucking area was 880 acres, in addition to which the 33 acres of 1897 tea was plucked towards the close of the year. The total quantity of Tea for disposal was 577,214 lb., including 5,076 lb. made from purchased leaf, of which 221,481 lb. were sold locally, averaging 33·68 cents per lb., and 355,733 lb. were shipped to London of which, 99,910 lb. had still to be accounted for; but the average obtained for the 255,823lb. as yet accounted for is 35·75 cents per lb. The cost of the tea delivered to buyers or put on board ship, including all charges, was 18 89 cents per lb., and the nett value realised from sales (a portion being estimated) was 34·77 cents per lb. (being 4 96 of a cent more than for the previous crop.)

The Company's property consisted on the 31st December, 1899, of :—

Acres	Tea Planted in	Yielded in 1899 lb. Tea per Acre.	
172	1885	602	Average yield from 880 acres, 646 lb.
298	1887	538	
100	1888	534	
42	1889	630	
6	1890	813	
52	1891	957	
120	1892	789	
68	1894	844	
37	1895	719	
75	1896	530	
33	1897	111*	
29	1898	not in bearing.	
24	1899	do do.	
966			
22	Acres Cocoa and Factory site.		
10	„ Cardamoms.		
255	„ Forest, &c.		

Total 1,253 Acres as per last report.

* Plucked latter end of season.

The estimate crop for 1900 is 580,000 lb. tea.

Mr. J H Starey retires from the Board, and the shareholders will be requested to elect a Director and also Auditor for the current year.

EXPERIMENTAL MANURING IN VICTORIA.—During the coming season the Victorian Department of Agriculture proposes to make a thorough trial of the value of manures in different parts of the colony. Not only will the recent experiments at St. Arnauld be repeated, but experimental plots will be treated with different manures in all the principal wheat-growing districts of the colony. The Minister of Agriculture states that he proposes to have four sets of fertilising drills at work, under the supervision of Mr. A N Pearson, the Government Agricultural Chemist, and Dr. Howell, and every care will be taken to give full publicity to the experiments. A number of sites have already been secured, and in making purchases of manures now on the market for the purpose of the experiments, the Government would take every precaution to ensure the identity of the buyer being kept a secret. Dr. Howell, who has recently joined the department, is now engaged in making a complete soil survey of the colony, and he is lecturing to farmers in all parts of the colony on manures and manuring and the splendid results to be obtained from the scientific use of fertilisers.—*Sydney Mail*, Jan. 20.

Correspondence.

To the Editor.

NEW METHOD OF HARVESTING RUBBER.

[Letter addressed to the President of the Chamber of Agriculture, by M. Josselme, of Cochin China.]

SIR,—I venture to address to you this simple note after reading an article by M. Bourdarie, which appeared on April 20, 1899, in your Review under the title, "The Cultivation of Rubber Plants." . . . . . I wish to reassure M. Bourdarie and those who have the same anxiety regarding the difficulties of harvesting and who consider it requires about one man per day per tree. This statement decided me to make known the simple method I have devised, and which reminds me, though it did not so strike me at first, of the simple process adopted in the "landes" of the Gironde for harvesting the resin. This method, which I showed two years ago to Drs. Yersin and Jacquet in Assam, while cutting into some stems of *Manihot Glaziovii*, saves all manipulation and allows of one single person to make at the same time the harvest of a number of trees. This is the way:—Small bags, or rather little pockets, of calico of the poorest quality and provided beforehand with two furniture brads, or any other means of fixing them, are rapidly affixed in the evening, the side next the tree being drawn tight. The next morning at dawn, or at the time of fixing the bags, a cutter following the first operator performs the incisions passing rapidly on from tree to tree. For the process I should prefer to the hatchet the large wood scissor called by the Anamites "fish's tail," driven in with one stroke to the required depth.

The sap flows into the pocket, the watery liquids are filtered through the cloth and evaporate, while the plastic substance remains in the bag and coagulates rapidly. It is easily detached from the tissue and nothing prevents one from submitting it before it hardens to any fumigations or antiseptic processes that may be necessary. True, by this process one would only obtain what might be called rubber in tears, but it would be more difficult to use fraud in this rubber.

The initial trouble in collecting would be much lessened in this way and that is a main point. Hitherto I have made only small experiments as my trees are but young. Need I say that the same pocket moved up or down will serve for many incisions on the same tree? . ,

I may add that the coarse calico lets through a milky substance as well as a clear liquid especially now while the rains are on. This varies with different trees and with the season,—Believe me, etc., etc., J. JOSSELME.

(From the *Revue des Cultures Coloniales* of Dec. 15.)

THE CACAO MARKET:

GIFTS OF CHOCOLATE AND COCOA FOR SOLDIERS.

London, E. C., Jan. 19.

DEAR SIR,—One of the signs of the great increase in the demand for cocoa and chocolate is the large share of attention it receives in the trade journals of late; in one of them alone (the "Confectioners' Union" for January) three special articles and nineteen paragraphs are devoted entirely to it, two of the paragraphs notifying the intention of two new firms going into the business of Cocoa Manufacturers.

Whilst new buyers are springing up on every-side, asking for samples from the Mincing Lane Brokers, it will be just as well for both buyers and sellers if it were brought home to them, rather more forcibly than appears to be the case at present, that samples cost money. The little paper bags used down "the Lane" for cacao samples hold about half pound each if filled, so if a dozen buyers ask for samples it means four to six pounds of cacao, at present values costing from 3s to 5s, and from all I see and hear, more than six pounds are sometimes wolved up by professing buyers to whom the broker who at present is forced by the custom of trade to give them out, although he knows the chances are against his getting any adequate return for the loss to his merchant, in the shape of orders, or spirited bidding, which so much sampling would warrant, at the sales. As the cost of samples come out of the shippers' profits, I think it is worthy of their attention, now that there is undoubtedly a much larger demand from *genuine* buyers who must be encouraged than formerly, for samples, to see that this right is not abused and that the samples they have to supply free do not go to help fill some bag which is then sold by the collector either down "the Lane" as "duty paid" cocoa, or may be is included in a direct sale to a manufacturer.

This week same as the previous one has been a good one for sellers. Fine Ceylons are still much wanted, 90s being paid in the sale for by no means Ceylon's record best, and should any such quality be offered just now—I mean beans with a nice even *light* cinnamon break free from whitish or darker beans, and with a bright "silky" outside skin—I believe, the competition would cause it to realise 100s, for by the great changes in values I am of opinion, buyers have orders "to buy on" limits much more elastic than usual. Some lots this week sold at prices out of proportion, simply owing to two or three buyers competing for the same lot, with the result that whilst some lots showed only 1s to 2s rise, another went at a good 5s higher than presale valuations.

This week 1,649 bags of Ceylons were offered, of which 1,305 bags sold, smalls and common native 55s to 68s 6d, fair to good native 69s to 75s. Middling to good red estate qualities 78s 6d to 83s 6d, fine 84s 6d to 90s.

The demand for Trinidads is also very good, sale rates varying from 80s to 82s 6d for good to fine red, and now anything approaching good red seems fairly easy to sell at 80s. The stocks of this growth are very low, being only 16,657 bags.

Grenadas at the sales went firm with an occasional rise of 6d and 1s, the best selling at 73s and 73s 6d against 72s 6d last mail.

As I anticipated, the idea of the Queen making a present of Chocolate to her soldiers has already been copied, one lady having sent 3,500 ½-lb. tins of Cocoa to be distributed amongst certain regiments at the front; this cocoa was supplied by Messrs. Clarke, Nicholls, & Coombs, Ltd., a well-known confectionery house, and one of the two firms I mentioned who are going in for cocoa.

I see by the papers, the Volunteers going to the front are particularly advised to take a quantity of chocolate in case of emergency, and being short of provisions, so on all sides the usefulness of cocoa is being recognised.—Yours truly,

HAROLD HAMEL SMITH.

PLANTERS AND AUXILIARY PRODUCTS.

Upcountry, Feb. 7.

DEAR SIR,—Now that we have to face more enemies than one, connected with the Tea enterprise, is it not time that all tea planters should turn their attention to auxiliary products suited to their different altitudes, so that we may be prepared to tide over troublous times when they do begin to make themselves felt? The prices most of us are now realizing for our staple product can but only help to keep the wolf away from the door; but when we are told of gigantic organizations to wipe us dry, by depriving us even of that last drop in the bucket, it behoves each and all of us to look alive and to be up and doing.

That such another crisis as this Island experienced in the early "eighties," is looming in the not distant future (this time not from disease but from numerous other causes too voluminous to mention) does not require a prophet's eye to discern, and when it does come, how many amongst us will then be found prepared to face the inevitable with all our eggs in the one basket, as most of us at present stand? I trow few, very few!

When the coffee catastrophe swooped down on Ceylon like a thunderbolt, those of the knowing ones amongst our planters of that day, who had cinchona planted on their estates, found and got no little help from that product to keep themselves afloat: a good many of those men will own up that their cinchona went no small way to help them to develop the new industry *tea*. Where in Ceylon is cinchona to be found now? Except in a handful of places, this product is a thing of the past. That this commodity is in demand cannot be doubted, when we see the "sons of the prophet" on the tramp offering quite 25 cts on the spot for a pound of dry bark. I only wish I was the possessor of a few thousand pounds of bark this day: what a haul I should have made!

I will (if you will permit me) through your columns offer a small suggestion to both lowland and highland planters. To the former I would suggest that they plant up all vacancies, roadsides, above drains, boundary belts, &c., with Para rubber, nutmegs and cloves—products well adapted to their climate—and all their flats and undulating lands with coconuts at 30 or 40 feet apart: this will in no way affect their tea. To the highlanders I would say, plant all your vacancies, roadsides, above drains, boundaries, &c., with a good jât cinchona. My brethren, take this advice in a good spirit as it is given in a kindly one; and perhaps, it may be, at the end of five years or so you may live to thank.

EXPERIENCE OF THE EARLY "EIGHTIES."

SUGAR CULTIVATION.

DEAR SIR,—*Re* your articles about sugar cultivation. Did not one of the Lords Elphinstone lose heavily by an experiment in this direction at a place called "Paradua" (I think), in the Kalutara district, in the "fifties?" Rumour had it that my Lord dropped some R30,000 over the business. I hope sincerely I may have been misinformed as to the loss sustained by Lord Elphinstone, but caution is required in all such ventures. E. F. T.

[The changes that have taken place in sugar cultivation and preparation in the past twenty years are very notable and our correspondent may be quite sure that Mr. Turner and his staff will do nothing rashly.—ED. *T. A.*]

PLANTING NOTES:

COREAN PEARL DIVERS.—The diving for the pearl oysters found off the Corean island of Quelpart is entirely done by women. Dressed in a kind of bathing suit, with a sickle in one hand and a gourd with a bag tied to it in front of them, they swim out from the shore as far as half a mile—boats cannot be afforded—and they dive, probably a depth of forty or fifty feet, to the bottom, cut the weeds with the sickle or if they find a pearl oyster, tear it off from the stone, and then put it into the bag, which is kept floating by the gourd. They do not go back before the bag is filled, which often takes more than half an hour.—*Home paper*, Jan. 16.

FOWLS IN FRUIT CULTIVATION.—In the old days of the *Agricultural Gazette* Mr. Alderman and Sheriff Mechi used to entertain the readers with stories of his agricultural experiences, including the work done by fowls in vegetable gardens and orchards in clearing-off insect-pests. This sort of work is being done now with approval in many parts of the world; and from abroad come encouraging reports of the value of chicken-peck. One fruit-grower writes:—"I enclosed half-a-dozen unproductive canker-worm infested Apple-trees in a chicken-yard, and as a result the insects were cleared, and the trees produced good crops of fine fruit." Another wrote:—"The hen has a golden claw; she is a professor of agriculture, too, and teaches clean culture, and lots of it, with high-feeding for a fruit-orchard." *Verb Sap.—Gardeners' Chronicle*, Jan. 20.

TEA IN ASSAM.—The heavy rain that fell in Upper Assam and the north-east tea districts generally the week before last, though it will render the first hoeing more easy and benefit general cultivation, comes rather at an inopportune time for those who commenced their pruning last month, inasmuch as it will bring out a flush tough, leathery, and sapless that will not be worth gathering for manufacture, and yet must be removed or *bangi* will be the result. We are generally prepared for (and expect) the usual Christmas showers but hardly for such an abnormal downpour as this. One or two complaints have reached us that the rain will delay clearance, but with these we have not the slightest sympathy, as there is quite enough land under tea for all likely requirements for the next two years.—*Indian Planters' Gazette.*

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

	1895.	1896.	1897.	1898.	1899.	Av of 29yrs.	1900.
	Inch.	Inch	Inch	Inch	Inch.	Inch.	Inch.
January ..	5·00	2·92	3·81	2·32	6·98	3·09	3·72
February ..	0·81	0·35	1·68	1·98	2·78	1·90	0·02*
March ..	1·84	5·64	3·66	4·21	0·88	4·92	
April ..	9·34	5·93	10·97	22·81	6·66	11·47	
May ..	10·09	9·31	8·30	5·80	17·73	11·89	
June ..	13·99	8·37	10·14	10·94	9·23	8·34	
July ..	0·52	2·85	5·24	6·15	1·11	4·49	
August ..	0·92	6·35	9·09	0·97	0·62	3·77	
September	4·09	10·99	4·58	6·90	1·48	5·13	
October ..	30·36	16·78	4·71	20·60	12 99	14·57	
November..	5·83	19.81	11·66	17·38	8·58	12·80	
December..	9·44	11·76	8·89	3·05	4·44	6·45	
Total..	92·23	101·06	82·73	103·11	73·48	88·82	3·74

* From 1st to 7th Feb. 0·02 inch, that is up to 9·30 a.m. on 8th Feb.—ED. *T.A.*

Ceylon Rainfall.

THE P. W. D. METEOROLOGICAL OBSERVATIONS FOR DEC. 1899.—We append this Monthly Return of rain from which it will be seen that the highest fall was at Maha-oya tank in the Eastern Province, 31·60 inches and the lowest at Negombo in the Western Province 0·38 inches.

WESTERN PROVINCE.

Negombo, Mr. Bucknall (6) ... 0·38
Kalutara Mr. Gregson (36) ... 11·32
Labugama, Mr. Bond (369) ... 8·19
Henaratgoda, Mr. Silva (33) .. 3·68

CENTRAL PROVINCE.

Katugastota, Mr. Morgan (1,500) ... 8·35
New Valley, (Dikoya) Mr. Ward (3,700) .. 3·56
Helboda (Pussellawa) Mr. Anderson, (3,300) ... 5·68
Yarrow Estate, Mr. Peto (3,400) ... 5·94
Peradeniya Mr. MacMillan (1,540) ... 6·68
Duckwari, Mr. Edwin (3,300) ... 12·92
Caledonia, Mr Goork (4,273) .. 4·83
Pussellawa, Mr. Powell (3,000) .. 5·43
Hakgala, Mr. Nock (5,581) ... 8·80
S. Wanarajah Estate, Mr. Tatham (3,700) .. 2·88
St. Andrew's (Maskeliya), Not received (4,200).. —
Padupola, Mr. Ward .. (1,636) ... 5·80
Mylapitiya, Mr. Rowland (1,707) ... 1·35

NORTHERN PROVINCE.

Mullaittivu, Mr. Sanmukam (12) .. 9·53
Jaffna Mr. MacDonnell (8) 3 37
Mankulam, (N. Road) Mr. Walker (167) ... 8·71
Elephant Pass, Mr Silva (7) .. 7·37
Vangalachettykulam, Mr. Oorloff (179) .. 4·70
Point Pedro, Mr. Roper, (24) ... 3·17
Jaffna College, Mr. Cooke (9) ... 2·28
Kayts, Mr. Kretser .. (8) .. 1·43
Kankesanturai, Mr. Pararachasingha (10) .. 2·00
Pallai, Mr. Silva (24) .. 6·30
Murikandy, (North-Central Road) Mr. Krester — 6·25
Nedunkeni, Mr. Sanmukam (122) ... 16·04
Chavakachcheri, Mr. Silva (16) ... 3·32
Udupiddi, Mr. Hastings (35) ... 3·48
Marichchukaddi, Mr. Thamotharampillay (14) 4·70
Murungan, Mr. Ramalingam (52) 7·05
Vavuniya Mr. Walker (318) 8·12

SOUTHERN PROVINCE.

Ella Vella Mr. Smith (262) 13·21
Kekauadura, do (150) 5·67
Denagama, do (286) 11·51
Udukiriwila Mr. Auwardt (235) ... 5·26
Kirama, Not received (260) —
Hali-ela Mr. Smith (200) 6·45
Tissamaharama, Mr. Peries (75) .. 5·62
Matara Mr. Smith (15) 5·15
Dandeniya, do (167) ., 3·68

Urubokka, Mr. Smith (890) .. 14·09
Elagala, Not received (121) —
Tangalla, do (94) .. —
Mamadola, Mr. Cade (56) .. 8·40

EASTERN PROVINCE.

Irrakkamam, Mr. Bower (42) ... 19·74
Devilana, Mr. Vanderstraaten (136) 15·10
Sagamata, Mr. Bower (40) ... 12·26
Ambare, do (65) 16·16
Kanthalai, Mr. Carte (150) 4·23
Allai, Mr. Carte (95) 17·10
Rukam, Mr. Vanderstraaten (120) ... 23 90
Periyakulam, Mr. Carte (20) ... 25·66
Chadaiyantalawa, Mr. Edge (57) .. 8·42
Kalmunai, do (12) 18·16
Rotewewa, do (30) 15·68
Lahugala, do (70) 9 90
Naulla, do (30) 8·10
Andaukulam, Mr. Carte (41) ... 21·83
Manalpuddy, Mr. Vanderstraaten (21) 11·10
Maha-Oya-Tank, Mr. Vanderstraaten (190) 31·60

N.-W. PROVINCE.

Magalawewa, Mr. Gunaratna (176) .. 2·84
Maha Uswewa tank, Mr. Crabb (160) ... 2·04
Tenepitiya, Mr. Churchill (8) ... 2·30
Batalagoda, Mr. Fonseka — 8·00

N.-C. PROVINCE.

Kalawewa, Mr. Carson (268) 6·18
Maradankadawala, Mr. Carson (443) ... 9·22
Mihiutale, Mr MacBride (354) .. 6·54
Horowapotaua, Mr. MacBride (217) .. 8·66
Madawachchiya, Mr. MacBride (285) .. 13·52
Topare, Mr. Jayewardane (200) .. 13·80
Minnerlya Mr. Morgan — 12·01

UVA PROVINCE.

Bandarawela, Mr. Tocke (4,000) .. 7·26
Haldummulla, Mr. Viramuttu (3,160) .. 9·55
Kumbukan, Mr. Emerson (446) ... 5·72
Koslanda, Mr. Emerson (2,258) ... 11 16
Tanamalwila, Not received (550) .. —
Bibile, Mr. Silva (880) 17·53
Taldena, Mr. Fernando (1,100) .. 20·96
Allutnuwara—Mr. Leembruggen — 20·71

SABARAGAMUWA.

Ambanpitiya, Mr. Caldicott (729) 9·29
Pelmadulla, Mr. Clarke (408) 5·92
Kolonna Korale (Hulanda-oya) Mr. Dabare (203) 8·76
Avisawella, Mr. Jeffery (105) 6 10

S. G. O. METEOROLOGICAL OBSERVATIONS FOR AUGUST, 1899.

The following is the return of the total fall of rain for August, from which it will be seen that the highest fall was at Labookellie, Ramboda, 28·45 inches, and the lowest at Hambantotta and Horakele Estate, Chilaw, 0·04 inches.

Colombo (40) 0·62
Ratnapura (84) 7·98
Puttalam (27) 0
Anuradhapura (295) 0
Mannar (12) 0
Jaffna 9 0
Trincomalee (12) 0·50
Batticaloa (26) 0·71
Hambantota (50) 0·04
Galle (48) 4·77
Kandy (1,654) 4·14
Nuwara Eliya (6,188) 5·22
Hakgala, Nuwara Eliya (5,581) 2·80
Badulla (2,225) 0·95
Kurunegala (381) 0·74
Maligakanda, Colombo Mr. Johnson (70) 0·89
Agricultural School Colombo, Mr. Rodrigo 1·01
Passara Hospital, Passara (Mr. Thomas) 2,200 3·63
Welhelmina Puttalam, Mr. Ratnayeke (131) ..
Horakele Estate, Chilaw, Mr. Beven (50) 0·04
Chilaw Kachcheri Chilaw, Mr. Koch (10) 0
Franklands Estate —
Veyangoda, Mr. Beven 0·93
Orange Hill, Ragama Mr. Bury (50) 0·22
Henaratgoda Gardens, Henaratgoda, Mr. de Silva (33) 0·93
Kotua Godella, Rambukana Mr. Windus (580) —
Eadella or Liberia Estate Polgahawela Mr. Craighead (425) 1·77
Geekiauakanda, Neboda — Mr. Towgood (200) —
Polgahakanda, Neboda Mr. Wight (300) 3·84
Labugama, Hanwella, Mr. Bond (369) 5·78
Rayigam, Horana, Mr. Dawson, (300) 3·07
Kanangma, Avissawella Mr. Cooke (200) 4·06
Dunedin Estate, Avissawella, Mr. Bayley, (400) 5·42
Digalla Avisawella, Mr. Tottenham, (400) 7·59
Pambagama, Avisawella, Mr. Bridgman (600) 8·11
Avisawella Estate Avisawella Mr. Byrde (250) 5·45
Yatideriya, Kegalla, Mr. Fairweather — 6·14
Mahawalatenna, Balangoda Mahawalatenna R M. -- 0·32
Agarsland Estate Balangoda Mr. Boyd (2,215) —
Maduwanwala, Rakwana, Maduwanwela R.M. (750) 1·63
Anninkanda, Morawaka, Mr. Anderson, (1,400) 7·85
Panilkanda, Morawaka, Mr. Davidson (1,900) 6·20
St. John Del Rey, Bogawantalawa Mr. Glanville (4,300) 6·41
Friedland, Bogawantalawa Mr. Rammell (5,200) 4·75
Campion, Bogawantalawa. Mr. Gidden, (4,840) 3·88
Blair Athol, Dikoya, Mr. Lane (3,641) 15·54
Annfield, Dikoya, Mr. Knight (4,300) 9·57
Maskeliya Hospital, Maskeliya Mr. Bulner (4,200) 9·05

Hope Estate, Hewaheta, Mr. Bagot (5,000) 3·81
Coldstream Estate, Watawala Mr. Spedding (3,800) 22·75
Holmwood Est., Agrapatana, Mr. Gray (5,240) 7·82
Sandringham, Agrapatana Mr. Orchard (5,200) 5·74
Gingran-oya, Kotmale, Mr. Cox (3,800) 17·07
Labookelle, Ramboda, Mr. Stone (5,000) 28·45
Dunsinane, Pundaluoya, Mr. Metcalfe (5,800 11·94
Sogama, Pussellawa, Mr. Eustace (3,500) 7·99
Kurundu-oya, Maturata, Mr. Corbetta (5,150) 0·36
Kabaragalla, Maturata, Mr. Maclean (4,200) 5·89
Maragalla Estate, Moopana, Mr. Betts, (2,200) 3·42
Moopana, Hospital, Moopana (Mr. Sela) (600) 3·38
Madulsima Hospital Lunugala Dr. Vethecan (2,600) 3·04
Meeriabedda, Haputale, Mr. Dupuis (3,600) 0·91
Udahena Estate, Haputale, Mr. Bisset, (4,400) 1·12
Post Office, Bandarawela, Mr. Mendis (4,036) 1·04
Callander, Ohiya Mr. Green (5,125) —
Mariawatte, Gampola Mr. Salmond (1,600) 4·84
Orwell Estate, Gampola Mr. Taylor (1,800) 4·98
New Forest, Deltota, Mr. Wardrop (3,500) 6·22
Rajawella, Estate, Telleniya Mr. Miller, (1,500) —
Lower Spring Valley, Badulla Mr. Rettle (3,650) 0·51
Gourakele Estate, Badulla Mr. Hope (1,200) 0·50
Moosagala Estate, Badulla, Mr. Deaker (4,500) 4·91
Ledgerwatte, Badulla Mr. Rettie (4,000) 0·45
Dea Ella Estate, M'walatenna Mr. Vanderslott (800) 3·19
Sembawatte Estate, N'pitiya Mr. Roe (1,600) 15·46
Gammaduwa, Estate, Rattota Mr. Westland (2,400) 0·88
Kobonella Estate, Rangala, Mr. Pole (3,300) 4·12
St. Martins, Rangala, Mr. Wyllie (3,600) —
Crystal Hill, Matale, Mr. Van Starrex (1,400) 0·87
Vicarton Estate, Matale Mr. Carrie (3,250) 2·87
Matale Mr. Tisseverasinghe (1,208) --
Wariapolla, Matale, Mr. Dickenson (1,200) 1·72
Dambulla, Mr. Sinnetamby (400) 0
Kotta Estate, Pallai, Mr. Todd .. (13) 2·02
Mantota Hospital, Mannar, Mr. Adams (17) 0
Buttala Hospital, Buttala, Mr. Perera — 0·10
Police Station, Hatton Police Constable Miskin(4,141) 17·21
Medway Estate Nilaveli, Mr. Abraham, .. 1·21
Delwita, Kurunegala Mr. Price (490) 3·20
Woodslie, Uragalla Mr. MacMahon (3,000) 1·26
Gillardstown, Wattegama Mr. Hardy (2,600) 8·98

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company.	paid p. sh.	Buyers.	Sellers.	Transactions.
Agra Ouvah Estates Co., Ltd.	500	950	—	..
Ceylon Tea and Coconut Estates	500	—	500 n'l	..
Castlereagh Tea Co., Ltd.	100	100	..	100
Ceylon Hills Estates Co., Ltd.	100	—	30	..
Ceylon Provincial Estates Co.	500	500	..	..
Claremont Estates Co., Ltd.	100	..	25	..
Clunes Tea Co., Ltd.	100	—	87·50	..
Clyde Estates Co., Ltd.	100	—	70	—
Doomoo Tea Co., Ltd.	100	—	—	—
Drayton Estate Co., Ltd.	100	..	150	..
Ella Tea Co., of Ceylon, Ltd.	100	—	—	70
Estates Co., of Uva, Ltd.	500	—	280	..
Gangawatta	500	—	..	—
Glasgow Estate Co., Ltd.	500	—	..	910 xd
Great Western Tea Co.,	500	—	640	...
Hapugahalande Tea Estate Co.	200	—	275	..
High Forests Estates Co., Ltd	500	—	575	..
Do part paid	350	—	—	410
Horekelly Estates Co., Ltd.	100	—	—	..
Kalutara Co., Ltd.	500	..	400	—
Kandyan Hills Co., Ltd.	100	—	70	..
Kanapediwatte Ltd.	100	100	97½	95
Kelani Tea Garden Co., Ltd.	100	45	..	..
Kirklees Estates Co., Ltd.	100	—	145	—
Knavesmire Estates Co., Ltd.	100	50	—	—
Maha Uva Estates Co., Ltd	500	—	450	..
Mocha Tea Co., of Ceylon, Ltd.	500	610	—	625 xd
Nahavilla Estate Co., Ltd.	500	—	475	...
Neboda Tea., Co. Ltd	500	500	..	—
Nyassaland Coffee Co. Ltd.	100	...	..	..
Ottery Estate Co., Ltd.	100	..	—	—
Palmerston Tea Co., Ltd.	500	—	400	...
Penrhos Estates Co., Ltd.	100	—	100	..
Pine Hill Estate Co., Ltd.	60	45	..	..
Pitakanda Tea Company	500	1,000	—	..
Putupaula Tea Co., Ltd.	100	—	120	—
Ratwatte Cocoa Co., Ltd.	500	—	—	..
Rayigam Tea Co., Ltd.	100	—	67½	67½
Roeberry Tea Co., Ltd.	100	45	—	—
Ruanwella Tea Co., Ltd.	100	—	70	..
St. Heliers Tea Co., Ltd.	500	500	—	..
Talgaswela Tea Co., Ltd.	100	—	—	...
Do 7 per cent. Prefs.	100	...	..	..
Tonacombe Estate Co., Ltd.	500	—	450	—
Udabage Estate Co., Ltd.	100	..	—	—
Udugama Tea & Timber Co., Ltd.	50	5	10	..
Union Estate Co., Ltd.	500	290	300	—
Upper Maskeliya Estate Co., Ltd.	500	..	500	—
Ovakellie Tea Co., of Ceylon, Ltd.	100	...	70	...
Vogan Tea Co., Ltd.	100	..	83	—
Wanarajah Tea Co., Ltd.	500	—	1145	...
Yataderiya Tea Co., Ltd.	100	—	430	430

Ceylon Commercial Companies.

Company.	paid p. sh.	Buyers.	Sellers.	Transactions.
Adam's Peak Hotel Co., Ltd.	100	—	—	..
Bristol Hotel Co., Ltd.	100	—	87½	..
Do 7 per cent Debts.	100	105	—	—
Ceylon Gen. Steam Navgt. Co., Ltd.	100	..	200	.
Colombo Apothecaries Co., Ltd	100	142½	..	145
Colombo Assembly Rooms Co., Ltd.	20	12·50	..	..
Do prefs.	20	—	..	..
Colombo Fort Land and Building Co., Ltd.	100	..	90	..
Colombo Hotels Company	100	...	—	303
Galle Face Hotel Co., Ltd.	100	..	155	155
Kandy Hotels Co., Ltd.	100	117½	—	117½
Kandy Stations Hotels Co.	100	..	30	—
Mount Lavinia Hotels Co., Ltd.	500	—	300	..
New Colombo Ice Co., Ltd.	100	170	—	170
Nuwara Eliya Hotels Co., Ltd.	100	27½	30	..
Public Hall Co., Ltd.	20	15	—	—
Petroleum Storage Co.	100	—	—	—
Do 10 % prefs,	100	—	...	—

LONDON COMPANIES.*

Company.	paid p. sh.	Buyers.	Sellers.	Transactions
Alliance Tea Co., of Ceylon,	10	8—9	—	7¾
Anglo Ceylon General Estates Co.	100	—	35—40	..
Associated Estates Co., of Ceylon	10	—	3—5	...
Do. 6 per cent prefs.	10	..	7½	..
Ceylon Proprietary Co.	1	...	12·6—17·6	..
Ceylon Tea Plantation Co.,	10	..	24½—25½	—
Dimbula Valley Co.,	5	..	5½—6	—
Do prefs.	5	..	..	—
Eastern Produce and Estates Co.	5	...	5½—6	...
Ederapolla Tea Co.,	10	...	7—8	..
Imperial Tea Estates	10	...	5—6	..
Kelani Valley Tea Asson.,	5	..	5—6	..
Kintyre Estates Co.,	10	7½	7—9	7½
Lanka Plantation Co.,	10	4½	4—5	..
Nahalua Estates Co ,	1	—	¼—¾	..
New Dimbula Co.,	1	—	2½—3	..
Nuwara Eliya Tea Estate Co.	10	9¼	9—10	9
Ouvah Coffee Co.,	10	7	—	..
Ragalla Tea Estates Co.,	10	—	10	..
Scottish Ceylon Tea Co.,	10	—	14—15	.
Spring Valley Tea Co.,	10	3	4—5	..
Standard Tea Co.,	6	—	11—12	..
The Shell Transport and Trading Company,	100	250	—	250
Yatiyantota Ceylon Tea Co.,	10	—	8—9	..
Yatiyantota pref. 6 o/o	10	—	9¾—10¼	..

BY ORDER OF THE COMMITTEE.

Colombo, February 9th, 1900

* Latest London Prices

THE LOCAL MARKET.

(By Mr. James Gibson, Baillie St., Fort.)

Colombo, Feb. 6th, 1900.

Coffee:—	
Estate Parchment per bushel	R7·50 to 9·00
Chetty do do	R5·00 to 6·00
Native Coffee / do F. O. B } per cwt.	} R38·00 none offering
Liberian coffee:—per bushel	R5·00
do cleaned coffee:—per cwt	R22·00 to 25·00
Cocoa unpicked:—per cwt	R38·00 to 41·00
do cleaned do	R44·00 to 47·00
Cardamoms Malabar per lb	R1·00 to 1·10
do Mysore do	R1·65 to 1·90
Rice:—	
Soolai per bag of 164 lb. nett	R9·00 to 9·25
Slate or 1st quality:—per bushel	R3·38 to 3·43
Soolai 2 & 3rd. do do do	R3·28 to 3·35
Coast Calunda	R3·87 to 4·00
Coast Kara	R3·75 to 3·87
Kazala	R3·25 to 3·28
Muttusamba Ordinary	R4·25 to 4·87 scarce
Cinnamon. per lb No 1 to 4	R00·58
do do 1 to 2	R00·62
do Chips per candy	R92·50 to 95·00
Coconuts Ordinary per thousand	R35·00 to 38·00
do Selected do	R36·00 to 40·00
Coconut Oil per cwt	R14·25 to 14·50
do do F. O. B. per ton	R285·00 to 290·00
Poonac:—	
Gingelly per ton	R97·50 to 100·00
Coconut Chekku do	R80·00 to 82·50
do Mill (retail) do	R77·50 to 80·00
Cotton Seed per ton	R85·00 to 87·50
Copra per candy	
Kalpitiya do	Nil
Marawila do	R43·50 to 43·75
Cart Copra do	R38·00 to 42·00
Satinwood per cubic feet	R2·00 to 2·25
do Flowered do	R5·00 to 6·00
Halmilla do	R1·90
Palu do	R1·00 to 1·12
Ebony per ton	R75·00 to 175·00
Kitul fibre per cwt	R28·00 to 30·00
Palmyra do do	R5·00 to 15·50
Jaffna Black Clean per cwt	R15·00
do mixed do	R12·50 to 13·50
Indian do	R8·50 to 13·00
do Cleaned do	R10·50 to 14·50
Sapanwood per ton	R55·00 to 58·00
Kerosine oil American per case	R8·00 to 8·25
do bulk Russian per tin	R3·40 to 3·50
do Russian per case	R7·00 to 7·25
Nux Vomica per cwt	R2·00 to 3·50
Croton Seed per cwt	R30·00
Kapok cleaned f o b per cwt	R24·50
do unpicked do	R6·00
Plumbago per ton, according to grade: Large lumps	R700·00 to 1000·00
do	R500·00 to 1000·00
Chips	R250·00 to 750·00
Dust	R100·00 to 550·00

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

Colombo, 5th Feb. 1900.

CARDAMOMS:—
All round parcel, well bleached per lb. R1·85
Do. dull medium do. 1·55
Special assortment, 0 and 1 only do. 2·25
Seeds do. 1·35

CINCHONA BARK:—
Per unit of Sulphate of Quinine 12c. 1 o/o to 4 o/o

CINNAMON :—
Ordinary assortment per lb. 59c.
Nos. 1 and 2 only per lb, 65c.
Nos. 3 and 4 only per lb. 52c.

CINNAMON CHIPS :—
Per candy of 560 lb R95

COCOA :—
Finest estate red; unpicked per cwt R46·50
Medium do do per cwt R42·00
Bright native, unpicked and undried per cwt } None
Ordinary do do do } None offering.

COCONUTS—(husked).
Selected per thousand R45·00
Ordinary „ R40·00
Smalls „ R28·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R80·00
Do. in bags none

COCONUT (Dessicated).
Assorted all grades per lb. 13¾c Nominal.

COCONUT OIL—
Dealers' Oil per cwt. R14·25 Closing at R14·00
Coconut Oil in ordinary packages, f. o. b. per ton R322·50. Marhet quiet but firm; supplies scarce.

COFFEE—
Plantation Estate Parchment on the spot per bus. R9·00
Plantation Estate Coffee f.o.b. (ready) per cwt. R65
Native Coffee, f.o.b 42·50. Nominal.

CITRONELLA OIL—
Ready do per lb. 65c—Per drum of 800 lbs
do do per lb. 63c—Per case of 90 lbs in tins.

COPRA—
Boat Copra per candy of 560 lb. R45·00
Calpentyn Copra do do R45·50
Cart do do do R42·00
Estate do do do R45·00

CROTON SEED per cwt R25·00

EBONY—
Sound per ton at Govt. depot R175,—as per last Governmen Sales, Nov. 15th.
Inferior per ton at Govt. depot R120

FIBRES—

Coconut Bristle	No. 1	per cwt	R11
Do	„ 2	„	8
Coconut mattress	„ 1	„	2·75
Do	„ 2	„	2
Coir Yarn Kogalla	„ 1 to 8		18
Do Colombo	„ 1 to 8		16
Kitool all sizes			38
Palmyrah			14

PEPPER—Black per lb 28c.

PLUMBAGO—

Large lumps	„ per ton	R1050	Little enquiry—Prices Nominal.
Ordinary lumps	„ „	1000	
Chips	„ „	750	
Dust	„ „	550	
Do (Flying)		200	

SAPANWOOD— per ton R60

SATINWOOD (ordinary) per cubic ft R2·40

TEA—	High Grown. cts	Medium. cts	Low Grown. cts
Broken Pekoe per lb	34 to 76	26 to 45	31 to 38
Orange Pekoe do	41 to 75	32 to 48	34 to 41
Pekoe do	32 to 50	27 to 39	30 to 34
Pekoe Souchong do	32 to 40	25 to 35	26 to 32
Pekoe Fannings do	27 to 36	24 to 34	25 to 31
Broken mixed—dust, &c. per lb	24 to 27	16 to 34	20 to 26

CEYLON EXPORTS AND DISTRIBUTION. 1899-1900.

COUNTRIES	Tea. 1900 lbs.	Tea. 1899 lbs.	Coffee—cwt. Plantation	Coffee—cwt. N'tive	Coffee—cwt. Total.	Cocoa cwts.	C,moms lbs.	Cinnamon. Bales lbs.	Cinnamon. Chips. lbs.	Coconut Oil. 1900 cwts.	Coconut Oil. 1899 cwts	Copra cwts.	Desicated Coconut lb.	Poonac cwts.	Coconuts No.	Plumbago. 1900 cwts.	Plumbago. 1899 cwts.	Ebony. cwts.	Sapan-wood cwts.
To U K.	9234216	6839091	390	..	390	4255	26877	59907	...	14437	8236	1200	472027	..	415235	6728	7751	...	240
„ Austria	100	150	..	..	..	..	..	...	..	1616	851	...	..	...	..	..	..	..	..
„ Belgium	...	563	27	..	27	63	...	16200	...	..	..	13762	...	5144	...	2643	1931	...	..
„ France	12834	21 57	..	...	..	..	...	34000	...	...	..	...	1200	...	..	..	...	...	...
„ Germany	39773	27140	..	..	..	..	19860	59900	71750	2245	..	15254	60143	3513	100905	6301	5405	...	...
„ Holland	..	..	..	..	..	...	...	..	11200	..	..	..	...	..	...	..	...	...	...
„ Italy	433	1040	..	..	..	...	...	13500	...	..	205	...	..	..	...	...	..	...	...
„ Russia	645408	..	15	..	15	...	..	..	...	..	..	9002	..	...	..	...	..	...	...
„ Spain	3170	..	..	...	..	..	..	1300	...	..	..	..	...	...	..	..	...	...	...
„ Sweden	12580	4268	..	...	..	...	..	...	..	..	..	..	...	..	..	105	..	...	...
„ Turkey	1400	2510	..	..	..	..	...	...	..	...	..	..	...	..	..	...	..	...	23
„ India	52301	59988	..	..	..	..	7014	..	..	5711	4395	..	..	..	..	..	15	...	..
„ Australia	855517	825457	267	..	267	..	..	...	3136	...	42	..	57470	..	..	10	70	...	..
„ America	541717	139232	..	..	..	..	...	20000	44800	15223	5513	..	80270	...	..	24717	11695	..	..
„ Africa	6330	1150	..	..	..	..	40	..	...	...	..	..	..	...	211260	..	..	..	...
„ China	41265	121718	..	...	..	52	..	...	...	...	703	..	7260	...	..	...	..	..	...
„ Singapore	1000	10872	..	..	..	..	..	...	..	...	15357	..	...	..	..	...	..	..	...
„ Mauritius	...	4000	..	...	..	..	..	..	..	...	..	..	...	...	...	..	...	..	...
„ Malta	32220	4380	..	...	..	..	..	..	..	...	...	...	..	..	..	..	..	..	...
Total export from 1st Jan. to 5th Feb. 1900	11479961	8062816	699	..	699	4370	53591	204807	130886	39230	35302	39218	678370	8657	727400	40704	26867	..	263

MARKET RATES FOR OLD AND NEW PRODUCTS

(From Lewis & Peat's Fortnightly Prices Current, London, January 24th, 1900.

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ...	44s a 100s
Zanzibar & Hepatic ,,	Common to good ...	20s a 60s
BEES' WAX, ,,		
Zanzibar & { White ,,	Good to fine	£6 a £7 10s
Bombay { Yellow ,,	Fair ,,	£5 5s a £6 10s
Madagascar ,,	Dark to good palish	£6 5s a £6 12s 6d
CAMPHOR, China ,,	Fair average quality	162s 6d
Japan ,,	,, ,, ,,	170s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	2s 6d a 2s 9d
	Middling, stalky & lean	1s 7d a 2s
Ceylon.—Mysore ,,	Fair to fine plump ..	3s 5d a 4s 1d
	Seeds ..	1s 6d a 2s 6d
,, Tellicherry ,,	Good to fine ..	2s 11d a 3s
	Brownish ..	2s 6d
,, Long ,,	Shelly to good ..	2s 11d a 4s
,, Mangalore ,,	Med brown to good bold	2s 3d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	3¼d a 4¼d
Madras ,,	..	
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	40s a 47s 6d
CINCHONA BARK.—		
Ceylon lb.	Crown, Renewed	5d a 7d
	Org. Stem	3¾d a 5½d
	Red Org. Stem	4⅜d a 5⅜d
	Renewed	5¾d a 7½d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts	Ordinary to fine quill	10d a 1s 8d
per lb. 2nds	,, ,,	9½d a 1s 5d
3rds	,, ,,	8½d a 1s 4d
4ths	,, ,,	8d a 11½d
Chips	,, ,,	2½d a 8d
CLOVES, Penang lb.	Dull to fine bright bold	4d a 9d
Amboyna ..	Dull to fine	4d a 5¼d
Zanzibar }	Good and fine bright	3⅜d a 4¾d
and Pemba }	Common dull to fair	3½d a 3 11-16d
Stems ..	Fair	1¾d
COCCULUS INDICUS cwt.	Fair	9s
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	100s a 115s
	Middling to fine mid ..	85s a 95s
	Low mid. and low grown	75s a 82s 6d
	Smalls	55s a 75s
Native	Good ordinary	30s a 70s
Liberian ,,	Small to bold	33s a 40s
COCOA, Ceylon ,,	Bold to fine bold	86s a 95s
	Medium and fair	76s a 85s
	Triage to ordinary	60s a 70s
COLOMBO ROOT ,,	Fair to good	22s 6d a 39s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair ..	£19 a £23
FIBRE, Brush ,,	Ord. to fine long straight	£19 a £21
Cochin ,,	Ordinary to good clean	£18 a £22
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £33
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	38s a 45s
CUTCH ,, ,,	Fair to fine dry	28s a 42s
GINGER, Bengal, rough ,,	Fair	25s
Calicut, Cut A ,,	Good to fine bold	87s 6d a 92s 6d
B & C ,,	Small and medium	35s a 72s 6d
Cochin Rough ,,	Common to fine bold	25s a 32s
	Small and D's	22s a 26s
Japan ,,	Unsplit	24s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	20s a 45s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £20
	Part yellow and mixed	£8 2/6 a £10 10s
	Bean and Pea size ditto	70s a £9 2/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	80s a 100s
Madagascar ,,	Fair to good palish ...	£4 8s a £8
	,, ,, red ...	£4 5s a £9
ARABIC E. I. & Aden ,,	Ordinary to good pale	40s a 60s
Turkey sorts ,,		67s 6d a 85s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 35s
Kurrachee ,,	Good and fine pale ...	52s 6d a 55s
	Reddish to pale selected	30s a 40s
Madras ,,	Dark to fine pale ...	23s a 35s
ASSAFŒTIDA ,,	Clean fr to gd. almonds	40s a 80s
	Ord. stony and blocky	12s 6d a 35s
KINO ,,	Fine bright	1s 6d
MYRRH, picked ,,	Fair to fine pale	65s a 75s
Aden sorts ,,	Middling to good	33s a 55s
OLIBANUM, drop ,,	Good to fine white	35s 6d a 50s
	Middling to fair	25s a 35s
pickings ,,	Low to good pale	17s a 20s
siftings ,,	Slightly foul to fine	16s 6d a 18s
INDIARUBBER, Assam lb	Good to fine	2s 10½d a 3s 4d
	Common to foul & mxd.	1s 4d a 2s 6d
Rangoon	Fair to good clean ...	2s 9d a 3s 2d
	Common to fine	1s a 2s 4d
INDIARUBBER, (Contd.)		
Java, Sing. & Penang lb	Foul to good clean ..	8d a 3s 3½d
Mozambique ,, {	Good to fine Ball ...	2s 8d a 3s 7d
	Ordinary to fair Ball..	2s a 2s 10¾d
	Low sandy Ball ..	1s 3d a 1s 7d
	Sausage, fair to good .	3s 2d a 3s 6d
	Liver and livery Ball	2s 4d a 3s 2½d
Madagascar ,, {	Fr. to fine pinky & white	3s a 3s 6½d
	Fair to good black ..	2s a 2s 10¾d
	Niggers, low to fine ..	1s 4d a 2s 10d
INDIGO, E.I. ,,	Bengal—	
	Shipping mid to gd violet	3s 9d a 4s 6d
	Consuming mid. to gd.	3s 6d a 3s 8d
	Ordinary to mid.	3s 2d a 3s 5d
	Mid. to good Kurpah	2s 2d a 2s 8d
	Low to ordinary	1s 11d a 2s 1d
	Mid. to good Madras	1s 5d a 2s 6d
MACE, Bombay & Penang	Pale reddish to fine	2s a 3s
per lb.	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 4d a 1s 4½d
MYRABOLANES, } cwt	Dark to fine pale UG	6s a 7s
Madras }	Fair Coast	5s 6d a 6s
Bombay ,,	Jubblepore	4s 3d a 7s
	Bhimlies	4s 9d a 9s 6d
	Rhajpore, &c.	4s 3d a 8s
Bengal ,,	Calcutta	4s 6d a 6s
NUTMEGS— lb.	64's to 57's	2s 4d a 2s 6d
Bombay & Penang ,,	110's to 65's	11½d a 2s 3d
	160's to 130's	6d a 11d
NUTS, ARECA cwt.	Ordinary to fair fresh	12s a 21s
NUX VOMICA, Bombay	Ordinary to middling	4s a 5s 6d
per cwt. Madras	Fair to good bold fresh	7s a 10s
	Small ordinary and fair	5s 6d
OIL OF ANISEED lb	Fair merchantable	5s 9d a 5s 10d
CASSIA ,,	According to analysis	3s 9d a 4s 6d
LEMONGRASS ,,	Good flavour & colour	3d
NUTMEG ,,	Dingy to white	3d a 3½d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 6d
CITRONELLE ,,	Bright & good flavour	11d a 1s 1/0½d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf	10s a 16s
	,, wiry Mozambique	10s a 11s
PEPPER—(Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ..	5 15-16d a 6⅛d
Singapore	Fair	5 15-16d
Acheen & W. C. Penang	Dull to fine ...	5¼d a 5¾d
PLUMBAGO, lump cwt.	Fair to fine bright bold	64s a 72s
	Middling to good small	25s a 50s
chips ,,	Dull to fine bright ..	23s a 57s 6d
dust ,,	Ordinary to fine bright	12s a 35s
SAFFLOWER ,,	Good to fine pinky .	60s a 65s
	Inferior and pickings .	40s a 57s 6d
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£20 a £50
Chips ,,	... ...	5s a £8
Madras, Logs ,,	Fair to good flavour ..	£20 a £50
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Bombay ,,	Lean to good ..	£4 a £5
Madras ,,	Good average	£4 a £5 nom.
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth	£6 a £7
SEEDLAC cwt.	Ord. dusty to gd. soluble	53s a 59s
SENNA, Tinnevelly lb	Good to fine bold green	5d a 8d
	Fair middling medium	4d a 5¼d
	Common dark and small	1¾d a 3½d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's / D's and B's / Small ...	£4 a £5 5s
Mergui ,,	Small to bold ..	£6 a £8
Mussel ,,	Small to bold ...	£1 a £2 15s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	15s a 16s
per cwt. Madras	Stony and inferior ..	7s 6d a 11s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	15s a 23s 6d
TURMERIC, Bengal cwt.	Fair ...	26s
Madras ,,	Finger fair to fine bold bright	35s a 42s 6d
Do. ,,	Bulbs ..	17s
Cochin ,,	Finger .	21s
	Bulbs ..	9s a 12s
VANILLOES— lb.		
Mauritius and } 1sts	Gd. crysallized 3½ a 9 in	17s 6d a 27s
Bourbon } 2nds	Foxy & reddish 4½ a 8 ,,	17s a 24s
Seychelles 3rds	Lean and inferior ...	10s a 15s
VERMILION lb.	Fine, pure, bright ...	3s 8d
WAX, Japan, squares cwt	Good white hard ...	30s 6d a 31s

THE

AGRICULTURAL MAGAZINE,

COLOMBO

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for February :—

Vol. XI.] FEBRUARY, 1900. [No. 7.

1900.

THE present number is the first of a new year (and indeed of a new century). Thile wishing that the the year 1900 has the maximum of good and minimum of bad in store for our readers, and that the agriculturists in Ceylon will experience the best of seasons and reap abundant crops, we cannot but introduce a personal element into this sentiment, and hope that the School of Agriculture will enter upon a new era. During the past year there has been a good deal of conference among those best qualified to give their views on questions connected with agricultural work, including agricultural education, and it is to be earnestly hoped that the conclusion of the whole matter will be a determination to establish an Agricultural Institntion—call it a Department or what you please—worthy of the colony and capable of fostering its agricultural interests.

A COMPARISON.

We read in a review of the Report on the Madras College of Agriculture that though "the farm (attached to the College) is not maintained with a special view to profit on experiment, the fact that the net cost thereof was less than Rs. 500 is creditable to the management," and that a large share of the income is obtained from the dairy herd kept on the farm.

Without in the least wishing to disparage the efforts of our sister institution in Madras, we should wish to point out that if we took credit for the income from our dairy herd in estimating the working of our school "farm" (to wit the cultivated area attached to the School of Agriculture) the "net *income*" would be represented by a few thousand rupees, and this would be substantially increased if the Model Farm revenue was added.

We feel inclined to envy the Madras College for being able to take credit for the income from the dairy herd in estimating the working of the experimental grounds, and placing it against the presumably substantial expenditure allowed for maintaining the latter—another circumstance which excites our envy. How do we stand? Why our vote for the Experimental Garden is practically *nil*, while the income from the dairy herd, and the grass farms attached to the school and the Model Farm goes to the credit of Revenue.

What the Colombo School of Agriculture has to deplore is the commercial spirit in which it is worked. It would be scarcely credited by those who have had any connection with Agricultural Schools and Colleges, that no special provision whatever is made for conducting the practical operations associated with the instruction imparted in our School of Agriculture. Not many years ago there was no dairy herd and no grass farms connected with the school, and though these latter now yield a handsome revenue, the school has the same needs now as it had then. Is it not reasonable to expect that the revenues referred to would have been utilized for the improvement and elevation of the school, especially when the institutions which yield the revenues are its offshoots, and their work directed from the school? So far from this being the case, the greater part of the grounds is in a neglected condition for want of a vote for the necessary expenditure required to maintain it as a useful experimental garden, an object lesson of clean cultivation to the students, and an ornamental purlieu of the city. The wonder then is not that the school has not produced the best results, but that it has been found possible to secure any students for the classes. In India they offer scholarships and appointments to induce the study of agriculture; here the prospects, to the intending student, are most discouraging.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF DECEMBER, 1899.

1	Friday ..	·02	17	Sunday ..	Nil
2	Saturday ..	1·13	18	Monday ..	Nil
3	Sunday ..	·52	19	Tuesday ..	Nil
4	Monday ..	·22	20	Wednesday	Nil
5	Tuesday ..	Nil	21	Thursday ..	Nil
6	Wednesday	Nil	22	Friday ..	·22
7	Thursday ..	Nil	23	Saturday ..	·15
8	Friday ..	Nil	24	Sunday ..	Nil
9	Saturday ..	Nil	25	Monday ..	1·36
10	Sunday ..	·4	26	Tuesday ..	2·5
11	Monday ..	Nil	27	Wednesday	Nil
12	Tuesday ..	Nil	28	Thursday ..	Nil
13	Wednesday	Nil	29	Friday ..	Nil
14	Thursday ..	Nil	30	Saturday ..	Nil
15	Friday ..	Nil	31	Sunday ..	Nil
16	Saturday ..	Nil			
				Total..	6·30

Greatest amount of rainfall in any 24 hours on the 26th inst. was 2·5 inches.

Recorded by Mr. J. A. G. RODRIGO.

GUINEA-GRASS.

Mr. A. A. Ramsay, F.C.S., Sugar Chemist to the Department of Agriculture, and Superintendent of the Sugar Experiment Station, Mackay, has kindly furnished the following analysis lately made by him of Guinea-grass. He says:—

Guinea-grass has been grown for some time now at the sugar experiment station, for feed purposes and also for seed.

In July we had a number of stools of over-mature grass, which the stock would not eat, while they seemed very fond of the young leaves shooting from stools cut previously. I was led, by this, to make analyses of two samples with the following result:

	Over-ripe Grass.	Young Shoots.
Moisture	70·92 ...	69·08
Soluble Albumenoids ...	·88 ...	·86
Insoluble do ...	·66 ...	2·20
Digestible fibre ...	1·94 ..	2·25
Woody fibre	20·11 ...	13·92
Soluble ash	1·07 ...	1·02
Insoluble ash ..	2·29 ...	3·55
Chlorophyl amides, &c.	2·13 ...	7·12
	100·00	100·00
Total nitrogen ..	·40 ..	·71
Total albumenoid nitrogen	·25 ..	·49
Albumenoid ratio ...	1:14·3 ...	1;5·3

I would state that these analyses are of the few stools of grass that were growing here, and available for our purpose, and no special cultivation or attention has been given them. The grass was planted in rows 3 ft. 6 in. apart and 4 ft. between the stools. The average weight of the shoots analysed (of overripe grass) was nearly 8lb.

From figures published under the authority of the Royal Agricultural Society of England I give, for the purpose of comparison, the total nitrogen in average grass, meadow hay and clover (these latter are calculated to 70 per cent. water for easier comparison). There are

Grass	..	4
Meadow hay	..	5
Clover hay	..	7

JADOO FIBRE.

By J. C. BRUNNICH,

Chemist to the Queensland Department of Agriculture.

Several articles have appeared in this *Journal* on Jadoo fibre, an artificial fertilising product, which, so far, has hardly received in this colony the attention it seemingly deserves.

The Department of Agriculture supplied a quantity of Jadoo fibre to the Agricultural College for experimental purposes, and the results of these experiments will be looked for with interest, although in our rich College soils the effects might not be so marked as in poorer soil.

In order to see if what the inventor claims is really true, I made a complete analysis of the product with the following result:—

I found Jadoo fibre to be a fine fibrous product, of brownish colour, which, almost like a sponge, has the power of absorbing an enormous quantity of water up to six to eight times its own weight. This fact alone will explain part of its practical value, when used for pot plants in the orchard or vineyard. This fibrous raw material is saturated with plant foods, which, according to analysis, are to a large extent soluble in water, any plant having thus a fair amount of plant foods at once available for its growth: another portion of the plant foods is like some in the soil not soluble in water, but soluble in hydrochloric acid, and these will become available gradually, by the chemical dissolving action possessed by the roots of growing plants. As a matter of fact, Jadoo fibre must be considered a highly fertile artificial peaty soil.

Analysis.

	Per cent.
Organic matters	71·40

Containing ·812 per cent. of Nitrogen=·986 percent. Ammonia. Mineral matters—

Soluble in water (total, 4·36 per cent.)

	Per cent.
Phosphoric acid, P_2O_5	·445
Sulphuric acid SO_3	1·286
Nitric acid, N_2O_5	·520
Alumina and Iron, Al_2O_3, Fe_2O_3 ...	·271
Lime, CaO	·303
Magnesia, MgO	·107
Potash, K_2O	·357
Soda, Na_2O	·750
Ammonia, NH_3	·020

Soluble in hydrochloric acid, 1·1 sp. gr.

	Per cent.
Silica, SiO_2	·031
Sulphuric acid, SO_3	·926
Phosphoric acid, P_2O_5	·715
Alumina, Al_2O_3	·765
Iron, Fe_2O_3	·170
Lime, CaO	1·875
Magnesia, MgO	·163
Potash, K_2O	·402
Soda, Na_2O	·791
	5·838
Insoluble in HCl...	4·012
Total ash	9·85
Moisture	18·75

The inventor does not claim the product to be a manure, and in accordance with the analysis the actual value of the plant foods, phosphoric acid, potash, and nitrogen amounts to 15/ per ton of Jadoo fibre. The secret of the preparation lies in the foundation material which has the power of absorbing and retaining the fertilising ingredients, which are thoroughly incorporated with the fibre by a slow process of fermented.

THE WEST INDIAN AGRICULTURAL DEPARTMENT.

The first number of the *West Indian Bulletin*, the official organ of the new Department of Agriculture, gives the history of the movement, and an account of the department, its purposes, aims, &c. The experimental and educational work which it is instituting, its field of operations, and the problems presented to it, make the new department worthy of more extended notice.

It will be remembered that the extreme depression of the sugar industry in the West Indian Colonies, which caused many sugar plantations to be abandoned and threatened others, led the British Government to appoint a West Indian Royal Commission in December, 1896, to investigate the condition of the Island and suggest measures for relief. The Report of the Royal Commission pointed out the causes of the "critical" condition, and emphasized the need of improving and cheapening sugar production, by the introduction and improvement of varieties of cane, better methods of culture, and the prevention of excessive losses in the manufacture of sugar in some cases by using more efficient machinery. It also strongly recommended the introduction of other farm industries where possible, and the teaching of agriculture in different classes of institutions. The commission commended the work of the botanic stations already established in a number of the islands, and recommended that they be enlarged and extended and placed under a central department of agriculture, which was to be charged with the promotion of the agricultural interests of the colonies in general.

The recommendations of the commission in this and other matters have been adopted and carried into effect. The British Government appropriated £4,500 for the new department for the first year, and it is estimated that in future an annual grant of £17,500 will be required to carry out the recommendations of the commission as adopted. "The cost of the department for a period of ten years, will be provided from Imperial funds, and grants will also be made in aid of the public revenues of Trinidad and Tobago (for the benefit of the latter islands), British Guiana, Barbados, the Windward Islands, and the Leeward Islands, to provide for or to assist in the maintenance of agricultural and botanical establishments, industrial schools, or other kindred purposes."

The headquarters of the department are at Barbados. Its duties as outlined are twofold: "(1) To endeavour to restore the sugar industry to a condition in which it can be profitably carried on, and (2) to encourage the establishment of other industries in such colonies as afford suitable conditions to supplement the staple industry."

In inaugurating its experimental work, advantage will be taken of the beginning previously made in experimenting in cane growing and the improvement of cane at a number of places, and this work will be greatly developed and extended. Four "principal" or "central" experiment stations and eight "local" stations for the improvement of the sugarcane will be established on the island of Barbados. The object of the central stations will be the growing of seedlings and improvement of varieties, and the carrying on of fertilizer experiments. The more promising varieties will be given a practical trial at the local stations to test their adaptability and value in different soils and localities, and also as a demonstration to the planters in each parish. Experiments on similar lines have been arranged for at Antigua and St. Kitts, while the work previously inaugurated at Trinidad will be largely extended and the necessary chemical assistance provided.

The botanic stations placed under the control of the department are those at Tobago, Grenada, St. Vincent, Barbados, St. Lucia, Dominica, Montserrat, Antigua, and St. Kitts-Nevis. The expense of their maintenance has been transferred to Imperial funds. The object of these stations is to test and distribute promising economic plants for the region, introduce new or little known plants for experimental cultivation, and conduct experiments on the improvement of sugarcane. In addition they distribute information, and send out lecturers for institute work.

The excessive losses in sugar manufacture on the smaller islands under the crude methods employed, is emphasized by the statements that there is "an average of over 2,000 pounds of sugar per acre left in the cane after crushing, which is burnt in the megass;" and that owing to heavy losses in boiling, 'for every 100 pounds of crystallizable sugar contained in the juice, not more than an average of 75 pounds of ordinary muscovado sugar is now produced." It is said that at present about 13 tons of cane are required to produce a ton of sugar on these smaller islands, while with efficient machinery 9 tons would suffice. The remedy recommended by the Royal Commission is the establishment of central factories, equipped with the best machinery, and it is the expectation of the department to establish one or two experimental factories at an early date.

The new department will also promote agricultural education in the islands, which heretofore has received little attention. The plan of the Royal Commission to establish agricultural schools in connection with the botanic stations has been carried out by opening a school at Dominica, and others will be started at St. Vincent, St. Lucia, and St. Kitts Nevis as soon as the necessary land is obtained. Furthermore, "the department is prepared to offer grants to enable certain institutions to employ teachers in agricultural science, and possibly provide a number of scholarships for the most promising pupils;" and in co-operation with the central educational authorities in each colony, the teachers in the elementary schools will be given a course of instruction in the principles of agriculture, to enable them to give simple instruction and conduct school gardens. It is proposed

to attach an agricultural instructor to each of the botanic stations, who will travel about holding meetings and demonstrations, and imparting information on improved methods directly to the planters; and in addition instructors or experts in special lines, as budding and pruning fruit-trees, curing tobacco, bee-keeping, etc., will be employed to spend a month or two on each island.

The publications of the department will also be a means of diffusing popular information. They will include handbooks on the cultivation of special crops, bulletins and leaflets, the latter especially being in very simple, clear language. The *West Indian Bulletin*, mentioned above, will be issued by the department periodically. The first number of this journal contains as an introductory, an account of the establishment of the department, and a report of the first agricultural conference held at Barbados. The latter contains a number of papers of merit on different features of cane growing, central factories, agricultural education, etc.

It will be seen that a very liberal and comprehensive plan has been adopted for acquiring and diffusing information, and that no effort is to be spared to make the department of the greatest direct benefit to the planters and to bring the teachings of agricultural science home to them. The progress of the new department in its various branches will be a matter of much interest to people of this country, especially in view of our interest in islands adjacent to those for whose benefit it was established. The experience there will prove of value, as well as the actual contributions to agricultural science and practice.

TO TELL THE AGE OF CATTLE.

The first ring at three years, and a ring on the horn for each succeeding year, is the usual way of reckoning; but as these can be rasped off, and some breeds do not have horns, it is advisable to determine certainly by the teeth. The unimproved long horns, and other old-fashioned breeds which are long in coming to maturity, were found to be later in the putting out of the teeth; but the following table, drawn by Professor Simonds, is reliable for Shorthorns and others which mature early. The same order is maintained as regards the front teeth or incisors in all animals—namely, the two to come through first are the central; the next pair consists of one on each side of them, and again one on each side of the laterals, the outer laterals following until the number (eight in the ox) is completed. The molars, or grinding teeth, also afford evidence to those able to distinguish them, but for all practical purposes the age is nearly enough ascertained by the number and development of the incisors. A rough-and-ready way of remembering is, first pair at one year and nine months; second pair at two years and three months; and so on, each pair being about six months later than the previous ones in breaking through the gum. As soon as the mouth is "full," or complete, the teeth begin to show wear, and gradually separate, as well as look narrower, and have interdental spaces, which go on increasing until, in very old animals, they fall out and leave gaps.

Simond's Table of Early Average. Improved Breeds.				Simond's Table of Late Average. Improved Breeds.				Girard's Table of Late Average. Unimproved Breeds.			
Y.	M.	No. of Teeth.		Y.	M.	No of Teeth.		Y.	M.	No. of Teeth	
1	9	2	permanent incisors	2	3	2	permanent incisors	2	3	2	permanent incisors
2	3	4		2	9	4		3	0	4	
2	9	6		3	3	6		4	0	6	
3	3	8		3	9	8		5	0	8	

A Writer in an American exchange says:—I have always regarded the horns of very small importance in showing the age of the cow when buying. It is true that the horns indicate the age, but not always accurately. The rings usually begin to come with the first calf. For instance, if a heifer drops her first calf at two years old, the first ring counts two; but if she does not calve until three, then the first ring counts three years. After the cow gets along in years, the most important thing on which her continuance of usefulness depends is the condition of her teeth. Generally, as long as her teeth last, she will continue to do well in the dairy; but when these fail, she will begin to go down hill. Therefore, it is never safe to buy a cow without looking at her teeth, for some fail sooner than others. For the benefit of those who are not in the habit of examining the teeth of the cow, I will describe their appearance at various stages. In determining the age of the cow, it is necessary only to examine the front teeth of the lower jaw—I say "lower" jaw, because a man came to buy a cow me some time ago, and objected to taking her because she had no upper front teeth. The calf has eight small milk teeth; but when nearing two years old, the two middle ones are replaced by two permanent and much larger ones. The two next ones come at three or a little before, two more at four, and at five years old the cow has a full mouth. The two middle ones are at this time about $\frac{3}{4}$ inch long, with the others growing shorter to the outside. After this the teeth grow shorter every year, and at seven years we may expect to find the teeth not much over $\frac{1}{2}$ inch. They keep on wearing off until at 9 or 10 years they are very much shorter and seem narrower, also barely touching each other. The gums also begin to shrink away, until sometimes a tooth or two may get knocked out by biting some hing hard.

By looking at the teeth of cows of which one knows the age, he may soon become well acquainted with their appearance. While it is impossible to tell exactly the age of a cow when over five years old, still one may judge near enough for all practical purposes. If a cow's mouth presents an 8-year-old appearance, it does not make much difference if she is nine or ten. She will, in all probability, last as long as the average 8-year-old cow. Dealers will often insist that a 10-year-old mouth belongs to a 7-year-old cow; but that is no reason why the buyer should be deceived. He can easily learn for himself.

SHOULD EGGS BE WASHED?

The *Rural New Yorker* sent out this question to a number of poultry experts, and, as usual, views differ.

The *New York Produce Review* may take its eggs dirty if it likes, but I shall continue to ship mine clean. I have been producing about 1,000 dozen a month for years, and every egg goes into a pan of lukewarm water as soon as it has been gathered out of the nest. All dirt is easily removed after the eggs have been allowed to lie in warm water a few minutes, and the heat imparted to the egg by the warm water causes it to dry quickly, and gives it that fresh appearance peculiar to a new-laid egg. If the water hurts their keeping quality, I have never heard of it. Thie testimony probably has little value, as my eggs get into consumers' hands before they have time to spoil. A few years ago I filled a few glass fruit cans with eggs, and then filled the cans with sterilised water at a temperature of 155 degrees sealing immediately. Eggs thus treated in December were in perfect condition after four months. The most expert chandler that I could find in the city said that they would pass anywhere for new-laid eggs, and Dr. W. E. Douglass, of Middleton, to whom I sent some, had them poached for his dinner-table, and said that no one at his table could tell them from new-laid eggs. The shells were in perfect condition so far as we could see, and the air cells smaller, if anything, than in a new-laid egg. I also tried some in the same way during the summer, but the water and eggs soon became tainted. From this I concluded that, although stated in the *New York Produce Review*, "wet eggs soon decay in wet weather," the cause is found in "warm weather," and not in "wet eggs."

Keep Eggs Dry.—The *New York Produce Review* is right. Eggs certainly are injured by washing. They will not keep so well or hatch so well as unwashed eggs. At least such has been my experience. The best that can be done for a soiled egg is to wipe it with a dry cloth; and, if the matter is important, carefully rasp the thickest of the dirt off with coarse sandpaper. If an egg is washed in either cold or warm water, it will be noticed at once that the "bloom" has disappeared, and a careful egg-buyer would at once pronounce it a stale egg. If only the fourth part of the shell is unsoiled, that part will show that the egg is fresh, because the "bloom" will be there. If you want eggs to keep well or hatch well, I would advice you to keep them out of water. Don't even rub them with a damp cloth. Keep hem dry.

FIBRES.

THEIR CHEMICAL EXAMINATION.

(*Dr. Dodge.*)

In presenting this phase of the study of fibres, I can but refer to the valuable work that has been accomplished in England in the field of chemical research by Messrs. Cross, Bevan, and King, and I will refer particularly to the Report on Indian Fibres and the work on Cellulose, the latter being a recent publication. The methods adopted in the chemical study of fibres and the processes essential to proper determinations are as follows:—

Moisture.—All the celluloses hold in their ordinary state a certain proportion of moisture, which, within the limits of variation (one-half of one per cent) due to atmospheric changes, is definite and characteristic of each fibre. It is noteworthy that the proportion of hygroscopic moisture is an index of susceptibility of attack by hydrolytic agents; it is certainly true that the textile fibres of the highest class are distinguished by their relatively low moisture. It is scarcely necessary to say that the moisture is determined by drying a weighed quantity of the fibre. It is necessary to raise the temperature to 110° to drive off the whole of the water; at 100° a fibre will often retain one per cent of its weight. Owing to the variations in this constituent, it is expedient to express all the results of analysis as percentages of the dry fibre.

Mineral Constituents.—The ash left on incinerating the fibre is determined in the usual way. The proportion is low in the ligno-celluloses, higher in the pecto-celluloses, especially when the proportion of non-celluloses is high. Cellular tissue further contains a higher proportion of mineral constituents than the fibers, and an admixture of the former therefore raises the percentage.

Hydrolysis.—There are two classes of reagents which intensify that resolving action of water upon organic bodies known as hydrolysis; they are the acids and alkalis. The destructive action of acids has not been included in the scheme of analysis. The action of boiling dilute alkalis, however, effecting a simpler resolution and involving very important points in the practical applications of the fibres, give results which form a necessary part of their diagnosis.

Example of Treatment.—The fibre is boiled (*a*) for five minutes in a solution of caustic soda (1 per cent Na_2O), washed, dried, and weighed, the loss of weight presents the proportion of the fibre which yields to the solvent action of the alkali; (*b*) in a second portion the boiling is continued for one hour—the loss of weight is an indication of the "degrading" action of the alkali. In many of the pecto-celluloses the hydrolytic action of the prolonged boiling is such that the non-cellulose is almost completely dissolved away. The power of resistance of a fibre to the action of bleaching processes, as well as the resisting of "wear" of the manufactured fabric in subsequent washings (laundering), where strong alkaline soaps or even chemicals are used, is shown.

Cellulose.—Celluloses, although similar in external characteristics, are of widely different chemical constitution, and vary considerably in their power of resisting the further action of oxidizing and hydrolytic action. A determination of the value and composition of cellulose is made

as follows:—A fresh specimen having been boiled in the dilute alkali (1 per cent Na_2O), is well washed and exposed for one hour, at the ordinary temperature, to an atmosphere of chlorine gas. It is then removed, washed, and treated with a solution of sodium sulphite, which is slowly raised to the boiling point. After two or three minutes' boiling it is washed on a filter when necessary, though in most cases it may be so placed in a funnel as to act as its own filter. Lastly, it is treated with dilute acetic acid, washed, dried, and weighed. The percentage yield on the raw fibre is the most important criterion of its composition and value.

Mercerzing.—This refers to the action of concentrated solutions of the alkalis upon vegetable fibres, particularly the compound fibres or those which are made up of a number of fibrils aggregated into a bundle, the larger portion of fibre consisting of such bundles. The action of the alkali often causes a very profound change in structure, not only dissecting the bundles, but altering the contour of the fibrils. The treatment takes its name from Mercer, whose original studies were for the determination of the structural modification which cotton undergoes when treated with strong alkalis.

Nitration.—When a fibre is exposed for one hour to a nitrating acid, such as a mixture of equal volumes of concentrated nitric and sulphuric acids, one of the most important results which follow is an increase in weight. An external characteristic which should also be noted is colour. A great deal of information regarding the constitution of a fibre is ascertained by this process.

Carbon percentages from Combustion.—This process consists in burning the substance with chromic anhydride in presence of sulphuric acid and leading over the gaseous products (CO and CO_2) into an apparatus in which their volume can be exactly measured. The two oxides of carbon having the same volume, the quantity of carbon in unit volume is independent of the composition of the gas, which therefore only requires to be measured. The carbon in the typical (cotton) cellulose is 44·4 per cent.; the compound celluloses, on the other hand, range themselves for the most part into two groups (1) of lower carbon percentage (40-43), (2) of higher (45-50), in the former the pecto-celluloses are included, the ligno-celluloses in the latter. This is considered a prominent chemical constant of the fibre substance.

Acid Purification.—The object of this treatment is to clean the fibre and remove accidental impurities, while occasioning the minimum loss of weight and therefore alteration in composition. For this purpose acetic acid (20 per cent) is chosen, the fibre being heated with the acid to the boiling point, then removed and washed first with alcohol, and lastly with water, dried, and weighed. The loss in weight sustained is thus determined. It is in the fibre thus purified that the carbon percentages are determined

In a report on the miscellaneous fibres in the Colonial and London Exhibition of 1886, by C. F. Cross, the scheme of analysis is thus briefly stated in tabular form:—

Seperate portion taken for each determination. Results calculated in percentage of dry substance.

Moisture	Hygroscopic water, or water of condition.
Ash	Total residue left on ignition.
Hydrolysis (*a*)	Loss of weight on boiling raw fibre five minutes in one percent solution of caustic soda.
Hydrolysis (*b*)	Loss of weight on continuing to boil one hour.
Cellulose	White or bleached residue from following treatment (1) Boil in one per cent. Na O H five minutes; (2) exposure to chlorine gas one hour; (3) boil in basic sodium sulphite.
Mercerizing	Loss on treating one hour with 33 per cent solution caustic potash, cold.
Nitration	Weight of nitrated product obtained by treatment with mixture equal volumes of nitric and sulphuric acids one hour, in the cold.
Acid Purification	Raw fibre boiled one minute with acetic acid (20 per cent), washed with water and alcohol and dried.
Carbon percentage	The carbon in the fibre from above, determined by combustion.

THE MICRO-CHEMICAL STUDY OF FIBRES.

The microscope is a valuable adjunct to the study of fibres, not only for the purpose of determining the dimensions of the ultimate cell, the thickness of the cell walls, the arrangement of the different kinds of cells in the plant tissue, and the relative abundance of the fibre cells, but all these taken together, with the employment also of certain chemical reagents, giving a ready means of determining the identity of the species of fibre where doubt exists as to the kind of fibre that has been employed in the particular manufacture under investigation. The methods to be pursued in this kind of fibre analysis should be fully understood by the textile student, as well as the industrialist and all others who handle fibres and fabrics commercially.

Among the text-books that may be consulted no better can be suggested than the valuable **work** of

M. Vetillart, of Paris, who has given many years of study to the subject. As the publication is in the French, it is not readily available to English students. An abstract of the methods pursued by M. Vetillart appears, however, in Appendix B. in the valuable paper "On the Identification of Fibres," which has been specially prepared by Prof. William H. Seaman.

The identification of fibres involves both chemical and microscopic study in many instances microscopic determination only being possible with the employment of the resources of the chemist, and the use of both systems, therefore, is essential. As the work of Professor Seaman covers the ground most thoroughly, a further consideration of the subject here is unnecessary.

PEABERRIES AND MALE COFFEE PLANTS.

Dr. D. Thomatis, commenting on a paragraph in the May number of this *Journal* (1899) on the subject of male coffee plants, writes:—

"As our Government Botanist, Mr. F. M. Bailey, states, the coffee plant is neither *diœcious* nor *monœcious*, but beyond doubt *hermaphrodite*, as clearly shown by the examination of its flower. Why should the abundance of *peaberries* fruit on a tree indicate that it is a *male?* Is not peaberry fruit all the same? And still more, a peaberry seed germinates as readily as a bi-lobed berry. The paragraph says that the cause of peaberry fruit is not definitely known. I am surprised at this statement, as it is very easy to find the cause, which is in the poverty of the soil and the dryness of the weather after the blossoming time, as through these two causes the young fruit could not be fully formed, developed, and nourished; hence only one lobe grew, and the germ of the other became abortive and atrophied, and consequently the single lobe or grain grew in a roundish form, and the fruit, being a single-grained berry, is richer in the essential aroma. If the ground be rich, season favourable, tree well trimmed and pruned, and blossoms thinned, very few peaberries will be produced."

Reporting on the question raised in the paragraph and in the above letter, Mr. Howard Newport, Instructor in Coffee Culture, says:—

In the accompanying letter on this subject, sent on to me for an expression of opinion, I fail to see where the question arises as to why the abundance of peaberries on a tree should indicate that it is a male.

On referring to the article in the May issue of the departmental *Journal* quoted by the correspondent, it would seem that the first mention of the idea was in the form of a contradiction. It is later contradicted by the Colonial Botanist, and is in itself a contradiction. The amount of peaberry on a tree has nothing whatever to do with the sex of coffee.

Peaberry is the result of the failure, for some reason or other, of its fellow-germ to fructify. There are naturally in the embryo berry two cells, and it would appear that under certain circumstances one of the cells, on coming in contact with the pollen, will fructify while the other will not.

That it is so is clear on examination of the peaberry where the atrophied germ is discernable, and its envelope of parchment skin, folded together, still in its place within the "pulp." The reason why the pistils should convey the pollen to one ovule and fail to fructify the other, is the point that is not thoroughly understood yet, and not the state of the tree in which it is most liable to this condition, as your correspondent seems to think.

The peaberry is a malformation, and generally takes place when the tree is weak or in a state of low vitality, and this condition may be brought about by unfavourable conditions of soil, climate, or cultivation. A tree overbearing will produce a larger percentage of peaberry than one with a more moderate crop, even though conditions of soil and climate are as favourable as could be desired.

The shape of the malformed growth is somewhat as your correspondent states. It was thought at one time that it was the production of a special variety of coffee-bush—at any rate, by those who had to do only with the cured article; and there are many yet that still adhere to this fallacy, due chiefly to the fact of its being graded separately.

Peaberry obtains its higher value in the market chiefly on account of the advantage of its shape in roasting. Being easier to roast uniformly, it is supposed to contain a greater percentage of caffeine or aromatic properties, but this is exceedingly doubtful. Its presence on the tree is of doubtful advantage also. A large percentage of "P.B." grade—indicating, as it does, impaired vitality—although its price is enhanced, is yet a long way short of the value of the double bean in the normal growth.

As a seed for propagation, "P.B." germinates readily, but repeated experiments have been able to show no advantage in the growth, stamina, or bearing capabilities of its production over that of the bi-lobe; nor does the plant raised from a peaberry show any special tendency to produce peaberries.

"*Male*" *Trees.*—The coffee-tree is, as is well known, hermaphrodite; it is also well known that in such cases generally the contact of pollen from another tree or blossom obtains better results than its own pollen. It may be, therefore, that the peaberry is due, to a certain extent, to continued self-fertilising of the plant or "in-breeding."

It is supposed that the plant commonly called the "male" coffee-tree is due to this cause. However this may be among seedlings in a nursery, there is always found a small percentage of plants that appear with long narrow leaves, eyes closer together than ordinary, and a smaller and more stunted growth altogether.

In cultivating these in the field, it is found they bear very little, although they blossom freely. (I have never yet met with one that did not bear at all.) The flower is somewhat smaller than that of the ordinary tree, but would structurally appear to be identical. It is supposed that the want of fertility is due to some malformation of the stigma or ovules, since the pollen is perfectly fertile when applied to other blossoms.

This tendency to produce blossom that will not fertilise, yet will fertilise others, has earned for this long-leaved tree the sobriquet of "male" coffee. Whether the presence of such trees in an estate is Nature's own remedy for a too long-continued course of "in-breeding," and is, therefore, of advantage, is a moot point. Generally the plant is considered useless and unnecessary (since the other trees, being hermaphrodite, can do without it), and since it bears so little, is not considered "worth its keep." It is, therefore, usually picked out and thrown away as early as it shows the telltale narrow long leaf in the germinating bed or nursery.

PRESERVATION OF EGGS.

The following is a report of experiments made at the Central Experiment Farm, Ottawa, Canada, of the two methods usually considered the best of preserving eggs. The experiments were conducted by Mr. Frank T. Shutt, chemist, Dominion Experiment Farm, and Mr. A. G. Gilbert, the poultry manager. Having received numerous inquiries from farmers during the past two months respecting the merits of "water glass" as a medium in which to keep eggs, we are led to think that certain conclusions drawn from an experiment, lately brought to a close, with this and other preservatives will be of interest to your readers. The investigation was commenced last September, perfectly fresh eggs from the farm poultry house being used for the test, which consisted in immersing the eggs for varying lengths of time, from a few hours to six months in (*a*) limewater, and (*b*) 10 per cent. solution of "water glass." Those eggs which were treated for a few hours, days, or weeks, as the case might be, were subsequently placed, together with the untreated eggs to be used as a check, in a rack within a drawer in the laboratory till the close of the experiment, 30th March, 1899. All the eggs were at a temperature from 65 degrees to 72 degrees Fahr. throughout the trial. The testing consisted in breaking the eggs into a glass and noting the appearance of the "white" and yolk, whether the yolk was stuck to the shell, size of air-space, odour, &c. The eggs were then poached and again the odour, appearance, &c., noted. Without giving in detail the results of the various trials, it may suffice for the present purposes to summarise the conclusions reached, as follows :—

CONCLUSIONS.

1. In no instance, either of treated or untreated eggs, were any "bad" eggs found.

2. In all cases where the eggs were not kept covered throughout the period of the test with the preservative solution, shrinkage of the contents had taken place, as shown by the larger air-space, less globular form of the yolk, and in many instances by the adherence of the yolk to the shell. The eggs treated for seven days and less with limewater showed somewhat less shrinkage than those treated a similar length of time with silicate of soda.

3. It would appear that limewater and "water glass" used continuously are equally efficacious in preventing shrinkage. They may also be said to give practically the same results as regards both external and internal appearances, flavour, &c., of the eggs preserved. Since "water glass" (silicate of soda) is more costly and more disagreeable to use than limewater, we could not from the present results recommend the former as the better preservative.

4. The albumen or "white" in all the preserved eggs was very faintly yellow (though not to the same degree in all the eggs), the tint becoming deeper on boiling.

5. No offensive odour was to be perceived from any of the eggs when broken, but in all instances a faint but peculiar musty or stale odour and flavour developed on poaching.

6. It is probable that no preservative will prevent the loss of flavour possessed by the fresh egg, but those which wholly exclude the air (and thus at the same time prevent shrinkage from evaporation) will be the most successful. Continual submergence is evidently better than treatment for a few days. The limewater may be made by putting 2 or 3 lb. of good fresh lime in 5 gallons of water, stirring well at intervals, for a few hours, and then allowed to settle. The clear supernatant fluid can then be poured over the eggs, which have been previously placed in a crock or water-tight barrel.

Some authorities recommend the addition of 1 lb. or so of salt to the limewater, but the writers are of the opinion that this is unnecessary, and probably leads to the imparting of a limy flavour to the eggs by inducing an interchange of the fluids within and without the egg. The all essential points to be remembered are :—(1) The the eggs to be preserved shall be perfectly fresh, and (2) that they shall be covered with the preservative fluid.

GENERAL ITEMS.

The extent of mortality in Sind amongst cattle, due to the famine, may be judged from the fact that one Trading Company alone has already purchased three million hides for shipment. Up to the present time the cattle have sufferred more acutely than the people. This is partly due to the promptness with which relief works have been opened, and partly to the rapidity with which grain has poured in from other Provinces by the natural operation of the law of supply and demand.

The stimulus given to the hide trade by the famine is not confined to Western India. The returns show a jump from nineteen to forty-nine lakhs of rupees in the value of hides exported from Calcutta in November, as compared with the corresponding period a year ago. The increase thus amounts to thirty lakhs in the same number of days, all classes of skins sharing in the advance.

The report of the Governor of Trinidad furnishes an agreeable contrast to the stories we have so often been told of the ruin of the West Indies. Writing in July last, Governor Knollys says: "There is no doubt that at the present moment Trinidad is more prosperous than it has ever been before."

In connection with the question of the appointment of scientific experts for the investigation

of questions connected with the cultivation and' manufacture of Indian tea, the Committee of the Indian Tea Association has recommended the engagement of an experienced Agricultural Chemist, recommended by Dr. Voelcker.

The Director of Agricultural Education to the Gloucestershire County Couucil, Mr. Howman, has carried out a series of interesting experiments in the manuring of fields. Plots of ¼-acre each have been annually manured under five different systems. Basic slag was used alone and iucombination with nitrate of soda. Bone meal was used with mineral superphosphate in a third case, while the two remaining plots were manured with kainit and gypsum. The quantities of each mar ure used are not given, but the following is the cost per acre:—For slag, 15s. 8d.; for slag and nitrate, 26s. 8d.; for bone meal and superphosphate, 16s. 8d.; for kainit, 7s.; and for gypsum, 5s. 6d. The whole of the plots on two different fields were manured five years ago, and have not been manured since. In 1895 the plot receiving slag alone returned an increased value per acre of 2s. 4d.; 1896 the field was grazed; in 1897 the increased value was 59s. 4d.; in 1898, 35s. 6d.; and in 1899, 51s. 8d.; or in all £7 8s. 10d. for four years. Where slag and nitrate were employed, the increased value as compared with slag alone was slightly more in 1895 and 1897, but less in 1898 and 1899; the total increased value for the four years being £6 4s. The bone meal and superphosphate gave a total increased value of 22s. 8d., the kainit of 2s., and the gypsum of £1 18s. 8d., so that the slag proved the most useful manures.

Mr. A. N. Pearson, Government Agricultural Chemist, Victoria. writes:—Bones in country districts, where crushing mills are not available, may be reduced by means of caustic lye, quicklime, or freshly calcined wood ashes. A simple plan is to pack the bones, layer by layer, with the calcined wood ashes taken fresh from the fire, in a barrel, cover the whole with a thick layer of soil, and keep the mixture moistened for some months. Casks may be kept in constant use for this purpose on a farm, receiving every few days a fresh layer of bones and ashes, removing the layer of soil for the purpose, and freshly calcining any old ashes that may have accumulated. A quicker method is to boil the bones in an iron or copper boiler with strong caustic lye. The proportions of bones and lye are not invariable, but may be taken as about 10 lb. canstic soda or 14 lb. caustic potash, dissolved in 3 gallons of water, to 30 lb. or 40 lb. of bones. The bones boiled for two or three hours in this lye should be completely disintegrated. Eveu without boiling, the lye will, in a week or so, disintergate the bones. Another method of softening bones is to mix them in heaps with quickline and loam. A layer of bones 6 inches deep is made, and on this is placed a layer 3 inches thick of quicklime, and then a layer 4 inches deep of loam. The layers of bones, lime, and loam are repeated until the heap is of a convenient height, when it is finally covered with a thick layer of earth. Holes are then bored into the heap from the top, and water poured in to slake the lime. The mass becomes hot, and will remain so for two or three months, after which the bones should be very friable. The whole heap may then be mixed up, and used on the ground at rate of 10 cwt. to the acre.

Watering is a question which perplexes many an amateur florist. How often shall I water my plants? How much shall I give at a time? Over and over these queries are made by correspondents. To which I can make but one reply: There is no hard and fast rule about watering plants. There can be none, because conditions under which plants are grown differ so widely that what would apply in one case would fail to do in another. But we have a general rule which is subject to such modifications as observation and intelligent study of one's plants seem to make necessary, and that rule is this: Wait until the surface of the soil in the pot looks dry, then apply water, and apply enough of it to thoroughly saturate all the soil in the pot. You can tell when this is done by the escape of some of it through the drainage hole in the bottom. Then wait again until the dry look comes on the surface before applying more. Of course Callas and other plants of a semi-aquatic nature will require more water than others like the Geranium and the Rose, and here is where study and observation must come in to enable you to care for your plants properly, To be a really successful plant grower you must understand the nature and habit of every plant in your collection, and so vary your attention as to give each plant the particular care it requires. One of the chief charms of flowers growing consists in this study of plant life. We take it up at first because we want to give our plants the attention they need in order to make a satisfactory development. In a little while we have become so interested in it that we continue it for the pleasure it affords us. It is a facinating study. It is a study in which there is always something more to learn.

The Annual Report of the Department of Agriculture says:—Rice being a crop more especially adapted to the North, did not come uuder the ban that was placed upon the grain crops that are grown in the South, and was favoured with a good season. This is becoming a staple grain crop in that part of Queensland, the area for 1898 showing an increase of 418 acres over 1897, that for the former year being 863 acres, with a yield of 38,133 bushels, or an average of 44·19 bushels to the acre, as against 29·19 for 1897. Hitherto rice has been in the experimental stage, has been grown in many parts of the colony, and has fluctuated in area as success or non-success has been met with. It is, however, now settling down to be the property of the Northern district, and it is to that part that the future supply may be looked for, for it behoves the farmers to be careful to grow the variety to suit the market, for of all grains rice is most subject to prejudice and favouritism. It is the grain that in the largest quantities comes into the hands of the consumer in the form that is most nearly allied to the original state, and so is dependent upon the fancies of the consumer for the variety that shall command

the highest price. From the figures of the Registrar-General, Queensland at present produces 14 per cent. of its annual consumption, the statistics being—Production (estimated at the rate of 162 lb. of paddy to the 100 lb. of clean rice), 1,318,176 lb. of clean rice; and the imports, 8,235,564 lb., of a value of £49,456. The principal district for rice is that of Cairns, which produced 82 per cent. of the total yield, 708 acres being cropped for 33,540 bushels, or an average of 47·30 bushels to the acre.

There are many so-called remedies for warts on animals which are more or less non-effective. The latest we have heard of appears to have proved successful in the case of dogs. A gentleman in England had a beagle puppy whose mouth, tongue, lips, and face were covered with white warts closely packed together. Several so-called remedies were tried without result, and the dog died, choked. A year or two after he had a cob with warts over the shoulder, neck, and face, when, either in print or from hearsay, he learned that warm bullock's blood would remove them. This was tried, on the principle that if it did no good it could do no harm; result, after two or three dressings the warts disappeared, and did not come any more. Another case. Five years ago he had six greyhound saplings, whose mouths, tongue, and lips, outside and in, were covered with warts. It was two days after discovery before he was able get to the butcher when killing. By this time a fine crop of warts had developed. The method was this: As soon as the bullock was knocked down and stuck, the dogs' heads were dipped in a bowl of the live blood, and all the parts affected were well rubbed with it while warm (after it begins to clot or solidify it is no use). The day after the first dressing the warts turned brown. Two days after they were dressed again. The following day they (the warts) began to get soft, and looked rotten, many of them falling out on being handled. After two days, dressed again, when they all disappeared, leaving small marks such as small-pox leaves. After a time nothing could be detected at all. He gives this as his experience. At all events, it is harmless and painless, and the price of a pint or two to the butcher is not costly. This remedy might be tried in the case of fowls. Warts on chickens may, however, be absolutely cured by dipping the fowls' heads in urine. After a few applications of this remedy the warts disappear. We cured nine valuable Cochin chickens in this manner, whose heads were a mass of warts.

The *Pacific Rural Press* describes as follows the system of propagating trees from cuttings with the aid of nurse roots. It is of especial interest in the relation it bears to the important discovery claimed by Secretary Lelong, of the California State Board of Horticulture, as to propagation by aid of "mother roots":—If you take a cutting of almost any kind and make a side cut upwards a little above its base, and insert in this cut a piece of the root of the same kind of a plant cut with a wedge shape at the top so as to fit closely in the cut in the cutting, this root will quickly callus itself to the cutting, send sap into it and start its growth. If the cutting were planted without this "starter" root, all the moisture might evaporate from its tissues (which is death to a cutting) before it can establish roots of its own to supply it with sap. Thus this root piece becomes a nurse to the cutting until it is able to take its own nourishment, as it soon will by means of roots emitted from its own tissue. There is no recent discovery about this. It has been kown for generations and has been employed in the propagation of all sorts of plants. It is simply one of the many forms of root grafting. If it is desired that the cutting grow upon its own roots alone, it is taken up at the end of the first season's growth and the nurse root is cleanly cut out and the well-rooted cutting is replanted. If it does not matter whether it grows upon its own roots and the enlargement of the nurse root (which is generally the case) it is allowed simply to go ahead as it likes. All roots on root grafts are nurse roots, more or less, because in almost any underground grafting you will have roots from the scion unless you take pains to replant with the whole of the scion or cutting above ground. This work can be done with cuttings of greater or less maturity. If you take last year's wood from a bearing tree you will, of course, get fruit in a year probably. If you take a cutting from a tree not yet in bearing you will have to wait longer. The speed of fruiting will be conditioned upon the age of the tree, and its habit of bearing upon wood of one or two years' maturity.